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A GLIMPSE OF UTAH BEEKEEPING

Problems and Advantages of the Beemen of the Beehive State

By Frank C. Pellett.

THE selection of the beehive as an emblem of the State of Utah is unusually appropriate. There are other states which offer as good beekeeping territory as Utah and others which produce honey of the same high quality, but there is no state where beekeeping is apparently recognized as an important industry to a greater extent than in Utah. The census shows that several other states have more bees and produce more honey, but the census would be a poor guide for the selection of a beekeeping location. Where men not only keep bees but make the bees keep them and where the investment and returns compare favorably with other industries, one finds real inspiration in the honey-producing business.

Utah has many things in common with several of the Western States: high altitude, warm days and cool nights, sunshine during a part of the day for almost the entire year, with the greater part of the honey crop of fine quality.

Considering the wealth and advantages which the residents of Utah now enjoy, it is difficult to appreciate the hardships which were endured by the pioneers, who found little and left much. The soil is fertile, but the rainfall is deficient and irrigation was necessary before dependable crops could be grown. In many cases the water is carried for many miles from the mountains to the valleys, where it is utilized. It was a sturdy race of men who laid the foundations for the present-day conditions, for whether it be cities, or roads, or schools, or farms, Utah is now second to none in quality of its possessions. Men and women still living have not only seen the transformation from the beginning, but have been actively engaged in bringing it about. In fact, even yet, in the Uintah Basin one may find the last frontier. Because of the long distance from the railroad, those who live within the basin must be largely dependent upon their own resources. Price is the railroad station from which most of the shipping for the Basin is done. Vernal, the largest town in the Basin, is 120 miles from Price. Before the days of the automobile, 120 miles was a long journey. Even now it costs a cent a pound for all freight hauled in or out of the Basin. This heavy charge, in addition to the railroad freight which must be added to get the products to market, limits the cash crops of the region to the few

J. C. Henager, President of the Utah Beekeepers' Association and Dan Hillman, State Apiarist.

which bring a high price per pound. Sixty cents per bushel to haul grain to the railroad makes it impossible for the farmers to raise grain to sell to the outside world. Alfalfa seed, honey and turkeys are the principal sources of cash in addition to cattle and sheep, which can be driven out on foot.

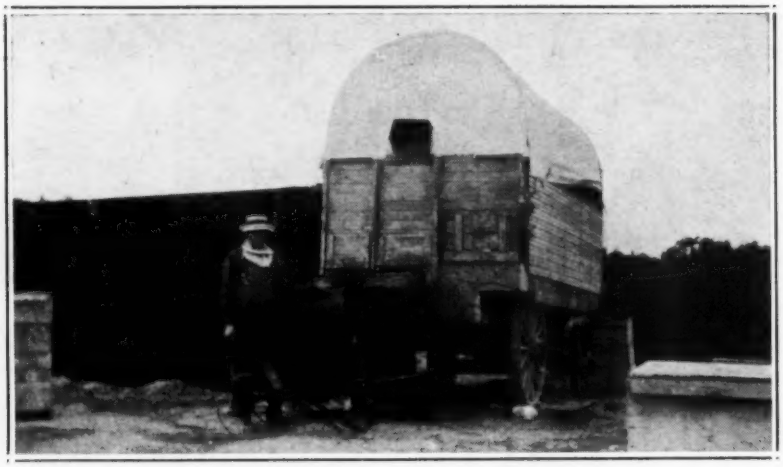
The alfalfa-seed industry in the Basin compares to corn in Iowa or wheat in North Dakota. Everywhere there are large fields of alfalfa grown for seed. The J. G. Peppard Seed Co. have loaded as high as 110,000 pounds of alfalfa seed in a single day at their Roosevelt plant, which is 93 miles from the railroad. Six million pounds of alfalfa seed were hauled out of the Basin in 1923. The 1924 crop was not yet harvested at the time of my visit and figures are not available on that as yet. Grimm is the variety most commonly grown, since seed of that variety is in demand at a higher price than common alfalfa brings. Formerly sweet clover was also extensively grown for seed but the price has fallen so much below that of alfalfa that little sweet clover seed is produced there at present.

A more promising field for honey production could hardly be found. The immense areas devoted to alfalfa-seed production offer unlimited pasturage for the bees. The marked difference between day and night temperatures, together with controlled moisture supply by means of irrigation, insures a good honeyflow. To these advantages we add the further one of the uniformly high quality of honey from alfalfa and sweet clover in this region; honey which should command the highest price in the world's best markets.

Honeyflows

In conversation with W. J. Harvey, of Upalco, I was told that in 1918 he had 110 days of honeyflow and secured 908 pounds from his best colony. Of this, 171 pounds was stored in ten days. His bees have averaged four sixty-pound cans per colony for the past four years.

Belliston Brothers, Wilford and Ralph, who have more than 700 colonies in the Basin and several hundred more at Nephi, gave me the figures on their Basin crops for the past five years. As they are among the largest producers of the state their production is probably fairly representative of what can be depended upon under similar conditions. In 1919, from 580 colonies, they secured a total of 1500 sixty-



Belliston Brothers' extracting wagon.

pound cans, or an average of slightly more than 155 pounds per colony. In 1920 they secured 2,245 cans from 630 colonies. This was an average of more than 213 pounds per colony. In 1921 they again secured 1,500 cans from 650 colonies, an average of 138 pounds per hive. In 1922 the crop was much smaller, being 985 cans from 750 colonies, or an average of slightly above 78 pounds per colony. In 1923, 700 colonies returned 1,623 cans of honey, or 139 pounds on an average. This makes a five-year average of a trifle more than 144 pounds per colony, which is certainly very encouraging for such a large number of bees.

One of the yards run by the Belliston Brothers is shown in the picture. This particular apiary is owned by R. T. Rhees, one of the largest bee owners in the west. One thing of particular interest is the fact that all the combs are built on vertically wired foundation. Mr. Rhees has been an advocate of vertical wiring for many years and has thousands of combs wired in this manner.

The yards are about two to two-and-a-half miles apart. The extracting outfit is carried on a wagon, which is moved from yard to yard as needed. They move about by means of autos and make camp near the yards where they work. One picture shows the Belliston extracting wagon and another shows the camp of Thomas Chantry, another extensive producer who has bees scattered all the way from Green River north to Neola, a distance of nearly 200 miles. Mr. Arnold gave an account of Chantry's beekeeping in our October issue.

Many of the large producers work a crew of men and live in camp much of the time during the active season. When one goes a hundred miles or more from home it is hardly practical to return home until the work in that particular locality is finished.

Beekeeping in the Uintah Basin is not much different from that in other sections of the state, except for the fact that more alfalfa is raised for seed and the honeyflows are accordingly longer and more dependable. More sweet clover is present, also, than is generally the case.

In addition to the large acreage of alfalfa and sweet clover, from which most of the crop is harvested, there is ample forage in most localities for building up the bees. The canyons are filled with such sources of early nectar and pollen as willows, dandelions, choke cherries, service berries, hawthornes and buffalo-berries. There is also white and alsike clover in the meadows. Rabbit brush is common over much of the state and yields an amber honey in late summer. In some localities some surplus is gathered from it, especially in the southern part of the state, where they sometimes get a super of honey from it after alfalfa yield is over. Cleome is the source of considerable surplus in a few locations.

It was my good fortune to attend the Uintah Basin Industrial Convention which was held at Ft. Duchesne and lasted for several days. A number of speakers were brought from a distance to furnish a program dealing with the opportunities and problems of the region. There were interesting exhibits of alfalfa and honey, the two major crops of the region. A large crowd was in attendance, including several hundred Indians from the nearby reservation. The Fort is the present headquarters for the Indian agency. The older Indians came dressed in their old-time finery of blankets and feathers and added much of interest for the stranger.

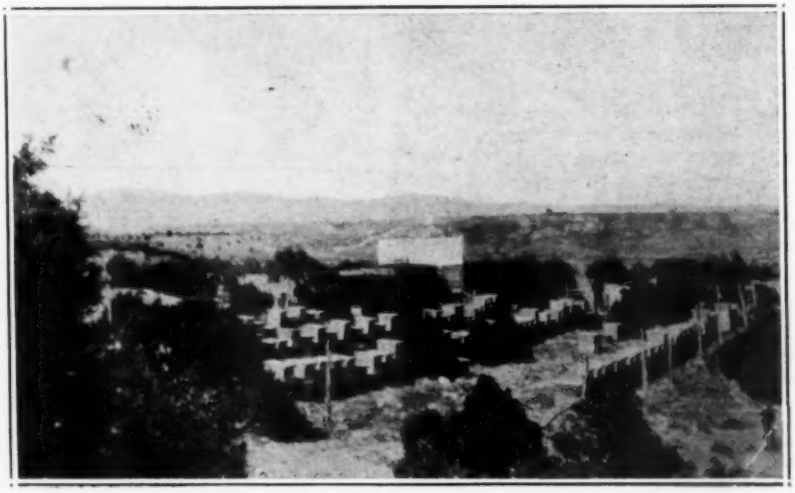
The Basin is rich in natural resources. With lumber, oil, coal, asphalt and gypsum in addition to rich agricultural crops, it only awaits the coming of a railroad to become one of the most prosperous regions of the west.

Utah Problems

There are four smelters in Salt Lake City, and accordingly the bees do not thrive in the immediate region, especially to the southward. Wherever one finds a smelter, little return is to be expected from the bees. Apparently the gases from the smelter are fatal to these insects. If one chances to be located opposite to the prevailing winds the bees may survive for a considerable period of time. One cannot but wonder whether gases that are fatal to the bees also have a bad effect upon the human race in the same region.

One hears of some difficulty from poisoning the bees from spray poison applied to fruit trees, but not nearly as much as is the case in Colorado. Probably the fruit-growing regions in Utah are of later development and spraying is not yet needed at such frequent intervals as in the older fruit districts.

In Utah, as elsewhere in the Rocky Mountain region, one hears much discussion of the wintering problem. There are many beekeepers who contend that no special protection is necessary, since the bees have frequent opportunity for flight during the winter months. Others contend that suitable packing makes a great saving in both bees and stores. I found few advocates of the big packing cases, however. It is quite generally reported that the bees died in these big cases when unpacked hives came through alive. The explanation was simply that the bees in the big cases did not come out to fly on mild days and that they died from accumulated feces, while the bees in un-



An apiary in the Uintah Basin.

packed hives were able to relieve themselves of the waste matter. Unfortunately, many have overlooked the importance of good stores when wintering in packing cases. It is probable that, had these bees been supplied with sugar syrup before the beginning of winter, they would have gone through the winter in the cases in excellent condition. In considering the big packing case in localities where there are few opportunities for winter flight, it is important that the quality of stores be given special consideration. I lost strong colonies in heavy packing cases, in Iowa, in severe winters, when the bees in double-walled hives came through O. K. The bees in the heavy cases missed one or two flights which the others had.

The most popular winter protection seems to be the Chantry let-alone hive. Chantry's hive is a double-walled Jumbo with a portion of the front of only one inch lumber. The idea is that the sun will warm the hive through the thin front wall and entice the bees out to fly as soon as it is warm enough. Every beekeeper using these hives spoke enthusiastically about them. They are very similar to the hives we have used at the Sunset Ranch in northern Nebraska for several years with satisfaction. Our hives, however, have double walls in front as well.

Some Utah Beekeepers

Utah beekeepers are fortunate in their chosen leaders. The picture shows J. C. Henager, president of the State Beekeepers' Association, and Dan Hillman, the State Apiarist. These two men make a good team and are doing much to advance the interests of their calling. Henager is manager of Henager's Business College in Salt Lake City, one of the best schools of its kind in the west, and at the same time, an enthusiastic side-line beekeeper. Hillman for many years lived on a farm and was extensively engaged in honey production while conducting a newspaper in Vernal. All his time is now occupied with the duties of his office.

Thomas Chantry' extracting crew making camp in the Utah Desert.

It is a big job to eradicate bee diseases from a state like Utah, but he is making a good start in that direction and seems to have the enthusiastic support of the big beemen of the state.

F. B. Terriberry, formerly State Apiarist, has been retained in the service of the beekeepers as Secretary of the Association. Because of failing health, Terriberry found it necessary to resign his official position and devote his attention to his bees at Midway, where he spends his summers, returning to Salt Lake City for the winter months.

Utah enjoys the distinction of the largest individual beekeeper in America, if not in the world, in the person of N. E. Miller, of Provo. It is doubtful whether Miller knows himself how many colonies of bees he has, but they number several thousand. The past season he shipped six carloads to California to increase them on the orange flow. An extended account of his beekeeping practice was given in the July number of this journal.

C. T. Rhees, of North Ogden, is another big operator with 20 apiaries totalling something like 3,000 colonies of bees. F. W. Redfield, of Ogden, is one of the men of outstanding success in the beekeeping field, having built up a large business not only in honey production and selling but also in supplies.

M. A. Gill, of Hyrum, is one of the most successful comb-honey men to be found. Like the others mentioned, he is worthy of a story all by himself, but space will not permit of more than passing mention. Unfortunately, one entire batch of pictures was a failure and we are unable to present the likeness of several of these men.

There are numerous others who produce honey on a large scale, each of whom has something of interest to offer. It gives one a feeling of enthusiasm for our honey-producing industry to visit with men who do things on a big scale and who are proud to be known as beekeepers.

Group of Indian women at the Ft. Duchesne convention.

Cornell Apis Club

The Cornell Apis Club has been organized for the coming year. Mr. R. L. Parker, of the Iowa Agricultural Experiment Station at Ames, Iowa, now on leave of absence for graduate work, is chairman. A series of talks by various members of the club have been arranged for the first half of the year, these being on the life and work of the following prominent apiculturists: Francois Huber, L. L. Langstroth, Moses Quinby, Charles Dadant, Dr. C. C. Miller, A. I. Root and Isaac Hopkins. The various speakers are Mr. Everett Oertel, formerly of the University of Wisconsin; Mr. H. A. Merrell, of Cornell University; Mr. P. R. Needham, Department of Entomology, Cornell University; Mr. E. J. Anderson, formerly of Pennsylvania State College; Dr. E. F. Phillips, Department of Entomology, Cornell University; Mr. R. B. Willson, Department of Entomology, Cornell University, and Mr. R. L. Parker.

SAYS "EAT MORE" SLOGAN NOT A GOOD ONE

Advertising Man Declares Public Won't Pitch In and Help You Just Because You Order It To.

By Virginia Caldwell

THE minute I was asked to write about "Eat More Honey" from the angle of the woman who tends the family pocketbook, I had a hunch that no bee magazine would want to print my real sentiments on such a movement.

"So the bee people are going to try to boss us womenfolk—and insult us too?" I asked, savagely.

"What do you mean?"

"Eat more honey, you stupid woman, is just what a slogan like that means. Didn't you ever have that in advertising psychology? Remember how it was pointed out that 'Buy this now' didn't have the effect intended, but instead was saying 'You're so stupid I have to tell you to buy it now, and it's no use to tell you what good it will do you; you do as I tell you.' "

"Got any authority for that?"

"Well, I don't remember just what textbook **that** was in, but I've got something that the Little Schoolmaster says about this 'eat-more' stuff," I replied triumphantly.

(The Little Schoolmaster's Classroom in Printers' Ink is read religiously by advertising and sales managers.)

"But it's three years old," I warned, "back when the fruit growers in California were first commencing to put their stuff across.

"If trying to sell that was bad business three years ago," came back to me, "it must be still. Human nature hasn't changed a lot in that short time. At any rate I haven't noticed that the female sex is any more willing to be bossed around. Let's see what the Little Schoolmaster said."

And this is what the advertising and sales managers learned in the "Classroom":

"The Schoolmaster thinks that the present advertising campaigns of the California Prune and Apricot Growers and of the California Associated Raisin Company showing the many uses to which their products may be put, are worth more than any amount of vague advertising under the general slogan of 'eat-more' of this and that.

"You can tell the public ever so many times to eat more, use more, or consume more of your goods, but you cannot expect the public to pitch in and boost your business simply because you need the help. But show the public what pleasure, comfort or convenience it will gain by so doing, and it is more apt to respond.

"A man may realize that prunes, apricots and raisins are good for him, but he doesn't want to face a steady diet of stewed prunes and a handful of dried raisins every day, but convince him that prunes when incorporated in a chocolate pudding are delicious and that a raisin pie is likewise, and he is ready to listen. The housewife, too, may like the idea of giving her family prunes, apricots and raisins for dessert, but when actual recipes are given, her interest is bound to be awakened.

"The Schoolmaster believes that too many campaigns intended to raise the consumption of a certain product have their language couched in the **imperative** mood. It is human nature to respond to **an order** best when the reason for it is explained."

A victorious mood led me to begin: "Does the gentleman speak the truth, the whole truth—?"

"Where do the ideas come from, if there are any, that interest the housewives in honey?" cut into my oration. "What chance have they for getting any actual recipes for using honey? I mean in a wholesale way."

I wasn't joking when I replied: "Women by the millions read recipes calling for honey."

Furthermore, I proved it by parading some of the women writers whose work was being syndicated to scores of newspapers and whose stuff about honey was offered as evidence. There were:

Jane Eddington, of the Chicago Tribune Syndicate, with her "Tribune Cook Book."

Elizabeth Hallam Bohn, with her "Homemakers' Helps."

Antoinette Donnelly and her Beauty Hints, of the Chicago Tribune Syndicate.

Hannah Wing, of the McClure Syndicate.

Winifred Stuart Gibbs, of Food and Health Education.

Sister Mary, of the Newspaper Enterprise Association.

Just how many women would be reached by any one of these syndicates I could not say, because, as a rule, they do not give out a list of their clients. But at least one of them was serving a hundred papers some time ago. Anyway, any syndicated material reaches a large number of readers; a syndicate has to have a good-sized number of papers as customers if it survives.

These writers were writing on honey in connection with cakes, desserts, custards, puddings, confections, canning, preserving, summer drinks, pyorrhea, diabetes, Christmas candy, baked apples and figs, nuts, cheese, chronic rheumatism, whipped cream, calories and what not.

All this I summed up in a brief way only to be met with a point-blank question:

"Then why isn't all this information about honey sending the women to the stores in droves to buy honey?"

But I had the answer ready:

"Because the recipes the next day may be about prunes, or dates, or raisins. And when the woman goes to the store she is reminded by the display of raisins, or figs, or prunes. She's not likely to see a notable display of honey, and she forgets all about it. **No woman can try out all the recipes she sees in the magazines and newspapers. The different foods compete with one another and the ones oftenest called to mind are the most popular. It takes advertising, publicity, display and exhibits to keep women from neglecting any one food.**"

Then I took pains to add, "I don't mean that some sales are not caused by recipes. There will be a large number of women who will remember a pleasing-sounding dish and will make it a point to ask for honey when they go to the store or order over the phone. But the proportion is small. There's got to be the constant reminding to get an even break with the other foods; and a family only spends so much money for food."

"Do you mean by that you think honey should be constantly advertised?"

"It all depends upon what you mean by advertising," I answered. "If it includes the displays in the stores as well as space in the newspapers I'll say 'yes' right off the jump. I'm sure that it's necessary to keep the stuff itself before the eyes of the women. But how and when to use advertising space is a problem in itself. It depends upon how much honey there was to sell and how the dealers were distributed. At any rate I'm not going to say 'Use More Advertising.' "

The North Carolina Beekeeper

This is the title of an annual, edited by J. E. Eckert, Secretary, for the North Carolina State Beekeepers' Association. It is finely edited, finely printed and treats of a number of subjects interesting to beekeepers. Mr. Eckert writes us:

"It is my conviction that North Carolina has great possibilities as a bee state and the possibilities and potentialities of our small association are just as great, and I am willing to do all I can to make our beekeeping industry take its rightful place in the line with other states."

The Association should be sustained. The publication is worthwhile. Mr. Eckert is offering to send a copy to anyone who will remit two cents for postage. Address him at the State College, Raleigh, N. C.

Short Course

There will be a short course in beekeeping at the North Carolina State College in Raleigh, on January 20, 21 and 22.

PROPER CELLAR TEMPERATURE

By J. E. Crane

THERE appears to be quite a difference of opinion as to the right temperature of cellar or special repository for bees during the cold months of winter. Perhaps it is not surprising that it should be so, for bees are not like apples or eggs that can be placed in cold storage at a temperature best suited to prevent deterioration or decay. Bees are living creatures and must have something to say as to their environment. Some persons have reported that their bees winter well when the thermometer ranges from 45 degrees down to 32 degrees. A few years ago 45 degrees was thought to be just right, and if we could hold the temperature at that point from fall till spring all would be well.

Of late a higher temperature has become the fashion and 50 degrees, and even 60 degrees have been advised.

Let us look at this matter a little. Bees are endowed with a certain amount of strength or vitality. If it is spent in great activity it will last but a few weeks, when they die of old age; but if they can be kept quiet they may live for six or eight months. This may be tested on a small scale by putting a few bees in two cages, with food, and keeping one in a warm room and the other in a cool room, just warm enough so they can feed themselves, and note how much longer those will live that have kept quiet by a lower temperature.

It may also be noticed that the more quiet they are kept the less food they will consume.

Here, then, lies the secret of successful wintering in cellar or special repository for this purpose. It is quiescence rather than temperature that tells the story of whether our bees shall go through the winter safely or otherwise.

It is natural for bees at the close of summer to cease rearing brood and to cluster quietly on their combs, although the temperature may be quite high, far above what one may consider proper in a cellar, and we have noticed that when bees are first placed in a cellar they remain quiet at 60 degrees. Later in winter a much lower temperature will be required to accomplish the same object.

There are many conditions that promote or prevent quiescence at a given time or place, and temperature must be made to fit conditions or our bees may be in trouble; for instance, a lower temperature will be required when one hundred colonies are placed in a small cellar than when but fifty are put in. Again, some years our hives are much better stocked with bees than in other years and require a lower temperature to secure the same results. One cellar may be much warmer than another and so require a lower temperature to maintain the same quiet condition of the bees. A small colony may be helped by a high temperature that would ruin a strong one. I remember, some years ago, leaving the entrance closed to a very small colony all winter. When I carried it out in the spring I expected to find it dead, but instead found it had wintered perfectly with scarcely a tablespoonful of dead bees on the bottom board.

If the temperature is too high in the cellar bees become active, consume more honey and are quite apt to start brood rearing very much to their harm. Some persons advise giving water in late winter to stimulate brood rearing. I have never practiced it for I have too often found colonies dead in spring that had been engaged in rearing a large amount of brood out of season. Brood rearing increases activity and consumption of honey, neither of which are desired during their winter confinement.

So we see there is no certain, definite temperature that is best for indoor wintering. It may be 40 degrees or 50 degrees, or higher. The main point is to keep our bees quiet; anything that hinders or prevents it must be avoided and everything that promotes it must be adopted if we would secure the best results.

A thermometer is well enough in the bee cellar and I usually have one there, but I had rather depend on my ears than on it, to tell whether my bees are wintering well. If there is a low murmur, scarcely audible, we know that all is going well. But we must see that our hives are properly ventilated.

Our strongest colonies will be placed in the coldest part of the cellar and the weaker ones where warmest, that each may be in a temperature best suited to its needs.

An uneven temperature, cool today and warm tomorrow, tends to make bees restless and uneasy, and should be avoided when possible.

So we see there is no one temperature that is best under all conditions; but that is best that keeps our bees most quiet. This will be, as a rule, much higher at first than later in winter.

THAT FOSSIL COMB

By Leslie Burr.

H. v. BUTTEL-REEPEN, in November A. B. J., gives us some interesting facts concerning the probable age of the bee, although I have to admit that I would have liked the article better had he described the various geological periods in everyday English rather than merely using the scientific geological terms. As to his argument concerning the fossil comb described, that by reason of the fact that it was a one-sided comb, it was, therefore, the comb of a wasp, I cannot agree. For unless I am in error, there are more species of bees that build one-sided combs than there are that build two-sided.

At the present moment I recall the summer of 1905. At that time I was living near a cocoanut grove in Cuba and my principal amusement was studying the actions of a large tree crab and a colony of stingless bees. Those bees built one-sided combs, one above the other, in the general form of a cone, the larger combs being at the bottom. An interesting feature was that each comb was only used once, for as the brood hatched the cells were torn down; the outside cells of the comb hatching first. New combs would then be built for the next batch of brood. Another interesting feature was that the comb was used for brood alone, honey and pollen being stored in large, irregular wax cells about the size and shape of walnuts. These latter cells were placed in large clusters about the brood combs. The space occupied by one of these colonies of bees was not to exceed half that of an 8-frame Langstroth hive, the brood constituting one-third or one-fourth of the space. In general appearance those bees are something like the Italians, but smaller. They never gathered much honey. I never knew of a colony yielding more than two quart bottles of honey. The bees store perhaps two or three times as much pollen as honey. Their natural home is in a hollow tree. The entrance is always a small wax tube, and so arranged that but one bee can enter at a time. The entrance is always guarded, the guard standing with its head at the entrance, and as each bee enters the hive the guard retreats to allow the entrance.

As to the family life of these bees, the queen is very easily found. She possesses a very large abdomen and I never saw one that was in any condition to fly. The worker bees appear to perform about the same duties as do those of the honeybees. As to whether these bees have drones, as do our honeybees, I was never able to determine, that is, I was never able to find any; neither was I ever able to find out their method of propagation. I never saw a colony swarm, or heard of their swarming. While they have no sting, they have very powerful mandibles and can dispose of a honeybee with ease. But they make no move to attack a person opening their home. The only way I could get them to bite was to poke one with a splinter of bamboo or other small object. This they would seize and would hold it like a bulldog. Legs and wings could be torn off and they would still refuse to let go.

While these bees were anything but pugnacious, I could not say the same of the tree crab. "But," to use the expression made famous by Kipling, "that' another story."

* * *

Now, of course, that fossil comb may have been a wasp's comb, in fact, considering where it was found, I believe that it was. Only my point is: the mere fact that the comb was one-sided does not prove it so.

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MEMORY OF BEES

Do bees recognize the spot on which the hive stood, after spending 4 months in the cellar? Dr. Miller said: No. It is a little bold to disagree with such a teacher, especially a man who wintered his bees in the cellar for fifty years. But, nevertheless, I say: Yes. Some of the old bees remember the spot. Let me give my experience.

We wintered bees in the cellar for some 16 or 18 years and finally gave it up because so many of our winters were mild enough to make the bees restless. We tried ice in the cellar, but it did not have enough influence to keep the bees quiet.

We had noticed, at times, that bees got more or less mixed when taking them out, so we had thought best to mark the location of each hive on its summer stand, by leaving the hive number upon its roof, which remained outside. So they were brought back, each to its location. But we were not absolutely positive of the bees remembering their stand. We found it out in the following manner:

We used two styles of hives, those with Quinby size of frames, now called Dadant hives and those with American or square frames 12x12½. About the same number of each were in the apiary, but they were located separately on both sides of the road. One summer, hiving two natural swarms, on the Dadant side of the apiary, we put them into two American hives, which happened to be empty. But those hives had to be brought over to the D. side and we neglected to return them after hiving the swarms. They were outside of the apiary rows, in rather conspicuous locations. We decided to remove them to the proper side, when we took them out in the spring.

On the afternoon of the day of removal from the cellar, a fairly warm day of March, my father, who was always watching and experimenting, called me to the apiary, as he had noted some bees acting queerly, hunting about two spots, on the D. side of the apiary. I came and quickly noticed that they were flying about the spots occupied by those two hives the previous fall. We immediately brought those two hives back to their old stands and it was interesting to see the lost bees alighting and fanning in front of the hives. After they had all alighted, we carried the hives back to the new location. After that they took note of the spot and there was no more trouble.

If those hives had not been in special spots, outside of the rows, we probably would not have noticed that any bees were lost. They would have entered the nearest hive, perhaps with a little fighting, and we could still have believed that bees did not remember their location of four months previously. That is probably why Dr. Miller, who was certainly an excellent observer, was of the opinion that bees did not remember their old spot.

But if it is all the same to you, I will recommend that you mark the location of each hive and return it, as closely as possible to the same spot, in spring. You will have less fighting and better home-coming conditions. If there is any tendency to fight or rob, the misunderstandings caused by change of location make matters worse. The loss may be very small, but why not avoid it if we can?

NATIONAL FOULBROOD ERADICATION

The League of American Honey Producers is disposed to take a very thorough method of foulbrood eradication, by making it a national issue. We have a number of people who believe in State Rights on every subject. This was inaugurated years ago, when some states wanted to continue slavery. But in all moral issues State Rights are a mistake. For instance, it is a mistake for an officer of the law to lose his official capacity when pursuing a criminal, just because he crosses an imaginary line which we call a "State Line." That is one reason why we have so much more crime than many other countries. The same point can be made in the question of a foulbrood law or of any criminal law. It would prove very much better if all states were under the same rule upon the question of foulbrood eradication.

Those of our beekeepers who do not yet belong to the American Honey Producers' League had better send their dollar to Dr. S. B. Fracker, Madison, Wisconsin, and become a member, then ask for the December Bulletin of the League, in which they will find the proposition of a National foulbrood eradication. It is in the line of progress, undoubtedly.

THE ILLINOIS MEETING

The meeting of the State Association was exceedingly interesting. The Secretary had succeeded in securing two speakers of international repute, Mr. Pettit of Canada and our own U. S. Apiculturist at the Bureau of Entomology, Mr. Hambleton. Both of these men had something worth while to say.

Mr. Hambleton described the work of the Division of Apiculture at Washington and gave the beekeepers to understand plainly that this branch of the Bureau of Entomology is there to serve the beekeepers of America and to make experiments upon live questions in beekeeping. Mr. Hambleton is a young man and has a good future before him. He is pleasant and very explicit in his descriptions.

Mr. Pettit, who is one of the most successful honey producers of Ontario, gave a lengthy description of his methods of extracted honey production and answered dozens of questions from the members present. He also described in detail his method of queen rearing for his own apiaries.

Two things he said which we should remember: He considers sugar syrup a very good food for winter and always feeds at least 18 pounds of it to each colony. This is placed by the bees in the center of the brood nest and helps towards good wintering.

The other fact which he made plain is that, in Canada, the consumers are so accustomed to buying granulated honey that he never thinks of melting his honey or heating it to keep it from granulating and that, in fact, the consumers expect to receive it already granulated.

The Association passed two resolutions: one commending the work of the Division of Bee Culture at Washington, the other asking the American Honey Producers' League to secure a uniform U. S. grading for honey, so that there might not be different gradings of honey for each state in the Union.

The attendance at the meeting was between 60 and 80. There should haye been five times that many. These meetings are exceedingly useful. At this meeting a committee was appointed to look after the appropriation to combat foulbrood. We need it and it must come. The Association asks for $20,000, for two years, or not less than $10,000 a year. Each beekeeper interested in the success of beekeeping, who wishes to see foulbrood disappear, should take it upon himself to interview his representative in the Legislature and ask him to vote for this appropriation. Foulbrood is getting less and **must** be made to disappear. A few more years will do the work.

SPANISH BEEKEEPING

In "La Colmena," a 4-page monthly published with the "Revista Social & Agraria," in Madrid, in the October number, they quote Berlepsch as having said that foulbrood dates from the time of movable frames and that the manipulation of combs is one of the causes of the disease. Hamet wrote the same thing and added that it was "usually caused by the inconsiderate spreading of the brood in spring."

These people did not yet know that foulbrood cannot exist unless the germs of the disease, "Bacillus larvæ," are in existence in the apiary. We kept bees in movable-frame hives for 40 years before we saw signs of foulbrood. Some of those writers have evidently mistaken "chilled brood" for "foulbrood." There is a slight difference between the opinion that some Europeans express concerning foulbrood and the opinions of Americans. They think the handling of combs causes foulbrood We think that foulbrood is spread by fixed combs of box hives or skeps, in which it is impossible to examine the combs, and in which the only way to detect foulbrood is, as Hamet wrote, "by the disagreeable odor which the hives exhale." When the disease has gone that far, it has had good opportunity to spread in the vicinity.

It may be borne in mind that foulbrood was already known in the time of Aristotle, before the invention of movable frames, and that Schirach describes it, page 56 of the Blassiere translation, and gave the first and only method of cure, by starvation. This was in 1771, so we are not progressing very fast, after all.

The same magazine which appears to support the idea that movable-frame hives are the cause of foulbrood, in the same article, discussing beekeeping in the Province of Galicia, says:

"The Dadant hive is very good, but we cannot deny that it requires much science to manage it. If in order to manage the Layens hive it requires science like one man (ciencia como uno), for the Dadant hive it requires science like four (como quatro)."

QUEEN INTRODUCTION

Is it out of place to speak of queen introduction in a winter magazine? I think not, for this is the time when we can digest what we read.

Our esteemed correspondent, D. Queen, in a private letter to the editor, expresses the opinion that "removal of the escort of a queen, before attempting introduction, by any of the usual methods, increases the probability of success by fifty per cent or more." But he prefers to "leave one bee with the queen, as an insurance that she will not be entirely neglected."

We strongly recommend the "removal of the escort," when we cage the queen for introduction. In fact we have always practiced it. Any one who wishes to try it will find that queens caged in a colony will almost always be fed by the bees, through the meshes of the cage, even if the colony is queenright. Much more readily will the bees feed a queen caged in a queenless colony. But likewise they will find that, if there is no food within reach of the inhabitants of the cage, all the workers in that cage will be allowed to die of starvation, except perhaps in a very full honey flow, when all the bees of the hive have a plenty of fresh nectar.

Neither is it any wonder that the bees of the hive should feed the queen and let the workers starve, for they evidently recognize her quality as a mother, while they may retain an animosity towards the stranger bees imprisoned within their midst.

When we handled imported bees, hundreds of them every summer, we always removed the queens from their bees and caged them singly, and whenever we left any workers with them we found them dead within the cage when the queen was released.

Some are of the opinion that a hungry queen is more likely to be accepted than a well fed one. This may also be a point in favor of keeping the queen in the cage away from the honey.

LARGE PRODUCERS

We are in the habit of considering ourselves, in America, as the largest producers of honey. But here is an English producer, who owns 1,167 colonies of bees in Langstroth and Dadant hives. He reports a greater crop from the Langstroths than from the Dadants, but the editor ascribes it to the fact that the former were old colonies, while the latter "newly started this season." At any rate, he declares his preference for the latter. His name is C. T. Lloyd, of Ashford Common, Middlesex. This from the Bee World for September, 1924.

PELLETT ON COMB HONEY

In the Bee World for September is an article from our Mr. Pellett. One thing which he says in it ought to be emphasized: "Comb honey cannot be produced to advantage, except under specially favorable conditions. A slow or intermittent flow will result in poorly finished sections and a short crop, where a good crop of extracted honey might be secured." This was exactly what induced us to abandon the production of comb honey. We had for several years an irregular production of honey, so that sections put upon the hives sometimes were left unfilled for two or three years in succession. On the other hand, while the bees were building combs in these sections, hives provided with combs already built soon filled them with honey to be extracted. This, more than any reported experiment on the cost of comb, convinced us that comb is exceedingly expensive to the bees.—Editor.

HOW LONG DOES A BEE LIVE?

In the "Queries" of the "Scottish Beekeeper," for November, the question of "How Long Does a Bee Live?" is properly answered by the statement that the age of a workerbee is not measured in days, but in work. This is entirely correct. A queenless colony will see the age of its bees reach a longer period than a queenright one, for the queenless bees do not work as actively as the queenright ones, and when they become very weak in numbers they practically remain at home all day long.

The writer of the reply to the above question states that once he "introduced an Italian queen to a black stock, and found black bees in that stock ten months and three weeks later." This introduction was probably performed in August, after the end of the honey crop and the bees had little occasion to be active after that date, until spring. The bees of a queen introduced in May, when the season begins, would not have lasted much longer than the bees hatched in the previous fall.

Mr. Langstroth wrote, in agreement with several of the early German breeders of Italian bees: "If an Italian queen be given, in the working season, to a hive of common bees, in about three months few of the latter will be found in the colony, and as the black queen removed left eggs in the cells, which take 21 days to hatch, it is evident that all the bees die from fatigue or accident, in the remaining 70 days, making their average life 35 days, in the working season." Our own experience made us change the words "few of the latter" into "none of the latter."

We have a high authority to sustain our experience in this matter; no less a man than Dzierzon wrote (see English translation of "Rational Beekeeping," page 20):

"The term of life of workerbees varies according to circumstances. Of the workers produced in May or June, few will be alive at the end of two months, if the weather allows them to be continually active. However populous a colony of common black bees, if an Italian queen be introduced in spring or summer there will be very few black bees left in the hive at the end of six weeks, and none, perhaps, at the end of two months."

Dzierzon is of the opinion that the kinds of flowers upon which the bees work, and the distance which they have to travel make a difference. It is all a matter, as our Scottish contemporary says, "not of days, but of work."

This matter is exceedingly important to the commercial beekeeper, for he must know when to expect the most work out of his colonies and cause them to breed accordingly.

THE INTERNATIONAL CONGRESS

No. 3—After the Congress

By C. P. Dadant.

MY first trip, after the Congress excursions, was to Ottawa, where I had promised to call upon Mr. Gooderham, the Dominion Apiarist. You have seen his portrait in the November number. Mr. Gooderham is a short man, but stocky, and his appearance gives an impression of great strength. He is strong, both physically and mentally.

I arrived at Ottawa at 8 p. m., and was conducted to the Chateau Laurier by an underground passage, from the station. In my room I decided to call Mr. Gooderham, but could not get him. My sons had given me the address of Mr. Tissot, a Belgian, who was very enthusiastic over our methods. So I called him up. A lady's voice answered, in very broken English, and I immediately switched to the other language. It had a phenomenal effect, for she promptly replied very cheerfully and said they would be exceedingly glad to have me call upon them the next morning. I did.

Mr. Tissot came to Canada some 16 or 18 years ago, learned the English language and became a detective in the service of Ottawa. He has only 18 days of vacation each year, with an occasional hour free. He took one of his remaining 6 days to visit with me and show me around. Yet with so little spare time, he manages, with the help of his wife and one or two of his children, to care for about a hundred colonies, under the Dadant system. He harvests upwards of 200 pounds per colony, average, per year. Although the season just past was reported poor, his average was still about the same amount. His main apiary, some 8 miles from the city, in a corner of the woods, is in Modified-Dadant hives, with 10-frame Langstroth hives for supers. They were piled 6 to 8 high, when I was there. Three hives on scales showed weights of 449, 480 and 482 lbs. One of them exhibited, inscribed upon the side of the hive, an increase of 45 pounds in 3 days. He ascribes his success to following the large brood-chamber system; he said: "I did not have those immense results till I adopted your system of large brood chambers, prevention of drone breeding and plenty of supers."

I was much impressed by the fact that, although I had heard the late Mr. Sladen, former Dominion Apiarist, say that our large hives were too large for Canada, and that, no matter what one did, it was impossible to avoid natural swarming in Canada, here was a man who had only 3 to 5 per cent of swarms, and succeeded best since he used the large hive, making his increase artificially as wanted.

We give a photo of the Tissot apiary, which will convey an idea of his immense crops. A similar photo of his apiary was given in Gleanings, for November, page 730. But they evidently did not know that he ascribes his success to large brood chambers, full worker combs and the Dadant system.

For four years past he has harvested, annually, upwards of 10,000 pounds of honey in this apiary of 50 to 60 colonies. The rest of his bees are in the city, near his home. His bees are pure Italian, carefully selected. One might think the location was extra good, but the apiary is within a quarter mile of a lake, which, of course, cuts out considerable pasture. He wants "good worker combs, no drone combs, good queens and plenty of room in the brood chamber as well as in the supers."

For winter, the brood chambers, which are all double-walled, are given each a bag full of absorbents in the cap. Then the apiary is surrounded with a high, tight board fence, which excludes the wind. The snow comes and covers the hives, sometimes 4 feet deep. "If you dig into that snow you will find that the warmth of the bees has melted a sort of tunnel under the snow, so that they need no other ventilation. There is no loss and we do not disturb them from November till April. But we give them ample stores, not less than 20 pounds of sugar syrup to each colony, before cold weather comes."

This tallies with our experience. In Canada and in our northern states, sugar syrup for winter, is very advisable, because it is a warmth-producing food, with the least possible quantity of unassimilable substance, although at the same time it has also the least muscle-building material. It is therefore very desirable for winter food, but not at all for brood rearing. In short, it is a warmth-producing substance, well suited for long confinement, whether out-of-doors or in the cellar.

In company with Mr. Tissot, I went to the Dominion apiary, expecting to find Mr. Gooderham. But he had gone to the Fair Grounds, as this was one of the big days of the Dominion Fair. We went there and saw Mr. Burch at the Government bee exhibit. He was busy doing a very wise thing, distributing leaflets upon the use of honey to anyone who appeared desirous of securing information. We ought to do that at our Fairs. They had a fine exhibit of honey and implements.

We played hide-and-seek with Mr. Gooderham, hunting for him while he was hunting for us, in the immense crowd. We finally gave it up, but had the pleasure of his visit at Mr. Tissot's home in the evening; though I would have preferred to see him at the Dominion apiary, where they are carrying on some experiments. They have around 100 colonies there.

I consider the Tissot apiary a very good evidence that, in Canada, as well as in England, France, Switzerland, and even in Russia, as well as in southern climates, the large brood chamber does all we claim for it here. No wonder people are enthused over what they now call "The Dadant System." And please remember that all we claim for the system is a combination of the ideas of Langstroth, Quinby and Charles Dadant, on points upon which those men agreed. Reduced swarming, no winter losses and economical summer management. By the use of the deep frames for brood chamber and of the Langstroth hives for supers, there is no need of discarding any of the apparatus. It is economy, for nothing is thrown away.

Mr. Tissot kindly saw me on the train at 10:30 and I arrived at Toronto the next morning.

If I have written at length of Mr. Tissot, who is a very modest man and does not wish publicity, it is because his success replies to objections made concerning the large hives in countries where summers are short. Ottawa is north of the 45th degree and has a short summer. The large brood chamber is a success even farther to the north.

Just a moderately full crop for Tissot. One can see, too, that Madame Tissot is a real help.

Winter packing in the Tissot apiary. Double walled hives, Dadant size, with odd hinged tops and burlap cushions.

At Toronto, during the few hours I had to spend, I called upon the Ontario Honey Producers' Association. I found Messrs. A. G. Halstead and W. A. Weir very busy men, in very cramped quarters. Their membership is increasing fast, 385 last year and 725 at the time of my visit. The Ontario beekeepers evidently believe in co-operation. The crop was reported less than usual, but judging by the number of samples of honey on their desks and their shelves, they must be handling a large amount of honey. They want to handle supplies also for their members, which seems the proper thing to do, but they will need much enlarged quarters. It may be that they have secured such quarters by the time this appears in print.

A very good idea which they practice is to have all the light colored honey in one color of pails and cans, green I believe, and the amber and dark honey in pails of another shade, so that one may always know at once what shade of honey is in the containers. The only objection is the necessity to have in stock containers of both colors, which may require a greater number, as one might have containers of the wrong shade for the crop in hand.

As my time was limited, I went the same day to Guelph. Our good friend Mr. Millen was expecting me and accompanied me to the hotel. We spent a couple of hours together and the next morning, early, we started off in his auto for Georgetown, to pay Morley Pettit a long-promised visit.

Any one who has ever met Pettit would know what to expect to see in his home or in his apiaries. He is a positive, exact and neat man. His honey house is a model. He was extracting honey, with two men to uncap and himself running two large Markle extractors. The weather was cool, but the honey house was warm, I might say hot, in order that the honey brought from the outapiaries be sufficiently thin to run well. He uses a wax-melting tank for cappings. I have never had any use for those capping melters, but as heat was needed and as the melted wax does not stop in the capping melter, but runs right out into a recipient, there is little if any damage done to the honey; at least I did not notice any change of flavor. But I could not be won over to the method of exposing the emptied supers out-of-doors, for the bees to clean them, as I saw that there was more or less damage done by the bees that carry away the honey. The evidence of it was in particles of wax on the boards where the supers had been exposed for a day or two. There would be additional objection, in our warmer countries, of possible breeding of moths in those combs exposed over night. Besides, we might be feeding other people's bees. Mr. Pettit reports that he has nothing to fear from this.

He uses the neat steam-heated knives for uncapping. By the way, I wish to criticize the uncapping scraper which I saw elsewhere, and which leaves a lot of broken wax in the extractor. The neater the uncapping is done, the less floating wax there is, the less need there is of straining the honey and the less loss of capping wax.

In the afternoon we went to the different apiaries, all neatly kept, just like his honey house, his yard and his home. I knew that his sister, Miss R. B. Pettit, who lived with him, died in 1923, and that he was a bachelor, but I did not know that he has another sister and a niece with him.

After a pleasurable day, I took the train, late in the evening for Toronto and thence to Winnipeg. When I bought my ticket, Toronto to Winnipeg, I was astonished at the information that it took nearly two full days for the trip. I did not till then find out that the distance between the two, on the Canadian National R. R., is 1,309 miles. What an immense country America is!

Next month I propose to tell about this trip, which was not the least interesting of my voyage.

INTRODUCTION TROUBLES

By J. L. St. Romain.

The Barthelemy article, "Possible Happenings With Two Queens in One Hive," on page 526, November issue, is interesting and I would like to let you know of my experience.

At one time during the summer I dequeened several colonies which had good tested queens that I had selected to ship as select queens. It was several days before I was able to return to these colonies to requeen them, so it was necessary for me to destroy all queen cells in each colony. The first few colonies had cells in abundance, so when I found one colony with only a few cells, I was surprised, and for fear of missing any, I looked over the combs more carefully and I was soon surprised to find eggs and young larvæ and another queen. All the cells were destroyed and the combs returned and arranged just as they had been. When the colony was examined again, about ten days later, no cells were found, and the queen was laying well. What would have happened if I had introduced a caged queen with this colony?

Another experience I had this past season might be interesting. I shipped six queens to a customer. These were to have been untested, but as I had not enough untested to fill all orders I sent this party four tested and two untested. About two months later I was surprised to receive a letter from this customer stating that he believed most of the queens were not pure. As he was only some thirty miles away, I went, a few days later, to his apiary.

Two of the queens had been introduced into colonies that were queenless a long time. In one of these colonies the queen was not accepted and in the other the queen turned out to be a drone-laying queen. Another colony had a jet black queen with a very weak colony. In the fourth colony I found many pure Italian bees that appeared young (the colony had been a dark hybrid, so the pure bees were easily noticed) but all emerging bees were black, or nearly so. The queen was bright enough to pass for Italian. The fifth colony was found to have some pure Italian and all emerging bees in it were also nearly all blacks and the queen was black. The sixth colony was like the fourth.

I conclude that the one queen that proved a drone-laying queen was probably hurt by the bees in the colony when she was introduced. In the third colony the introduced queen was killed and bees produced one from their brood. Queens in fourth, fifth and sixth colonies were accepted, but the apiarist in charge evidently did not destroy all queen cells and a virgin queen that hatched in each of these colonies killed the laying Italian queens. I would like to know if anyone has ever had experience to tally with this?

Louisiana.

BEEKEEPING IN THE ARGENTINE

By Leo G. Hughes.

BEEKEEPING has made great strides in the land of rolling plains within the last decade. The area of the country is roughly 1,100,000 square miles and the population about 9,000,000, of whom over a million and a half live in the capital, Buenos Aires. Fully one-third of the inhabitants are foreigners; there are few Indians left now and certainly not above 5,000 blacks. The principal products are grain and meat, of which the annual exportation in round figures is as follows: wheat three and one-half million tons, linseed one million, corn three million and meat one half a million tons. In 1920 goods to the value of $934,967,699 were imported, while just over a thousand million dollars worth were exported, Arg. gold. Since then trade has fallen off considerably, with the result that the paper dollar is only worth about 34c American gold, whereas its par value is 45c. This date will suffice to obtain a general idea of the economical conditions of the country.

From a beekeeper's point of view there are three different honey regions in the Argentine, excluding Patagonia, to-wit: the eastern or clover region, wherein are found eucalyptus trees growing in great profusion; the western or irrigated alfalfa region where the bulk of the honey is obtained, and the northern or indigenous flora region, with its millions of acres of nectar-bearing trees. It is here where the great orange plantations have been located and much honey is obtained from this source.

Beecraft has been practiced from the time of the Spaniards, who were alive to the fact that much profit could be obtained therefrom, judging from the immense quantities of honey gathered by the small wild bees of the woods where the mesquite abounds. These wild bees are still to be found in the forests, where they build their homes in the form of a sphere, a foot or so in diameter. The outside protection is similar to the fibrous materials employed by the wasp and the entrance is situated at the bottom, the whole hanging to the branch of a tree a few feet above the ground.

The author's apiary at San Luis, near the Parana River, across from Paraguay, in Northeastern Argentine.

The mean temperature in the latitude of Buenos Aires fluctuates during the summer months, October-March, between 50 and 95 degrees Fahr., while the temperature at noon the remainder of the year is usually about 59 degrees Fahr., falling to 20, and in extreme cases to plus 10 Fahr. during the winter months. Snow is seldom seen, therefore the winter problem, which tries the beekeeper in the States, is fortunately unknown. There are no rainy seasons although more rain falls during the summer months than during the rest of the year. The yearly precipitation is heaviest in the eastern region, where 50 inches is usual, while half that is common in the center of the country. Per contra, in the western irrigated region they are lucky if it averages 6 inches.

Bee appliances are dear compared with the prices charged in the United States. For instance, knock-down 10-frame Langstroth hives, with metal covers, cost from $5 to $7, according to whether they are made from native timber or imported from the States. Hive bodies cost $1.20 to $3.00, and one hundred frames $11 to $14, according to the source of manufacture. Native comb foundation runs to $1 the pound, while that from the States costs nearly double. An uncapping knife sells for nearly $3 and a four-frame reversible extractor will easily run away with $200 by the time you get it to the apiary. With bee ware costing so much, honey prices should be correspondingly high, but such is not the case. The producer is lucky who obtains 10c the pound for his honey in bulk, and when offered in containers of one to two pounds capacity, the price is 7c more. The consumer usually pays for the same article, when packed, at the rate of 70c the pound, and much of what is sold as honey never was inside a bee. All the prices quoted are in U. S. currency.

Apiary of Louis Jensen at Mendoza, about a hundred miles from Santiago, Chili, in western Argentine.

No census has been taken yet of the number of colonies in exploitation, and consequently, it is impossible to obtain figures as to the average yield per colony. Drought and locusts are among the principal causes of failure, thus last year a combination of both evils was experienced in the central region resulting in a considerable diminu-

tion in the honey crop. An average of only 30 pounds per colony was extracted in the San Luis province, as against 100 pounds in a normal year. In the western region, where alfalfa and fruit are cultivated in the alluvial soil deposited by the torrents which flow from the mighty Andes, yields of 300 lbs and over are of frequent occurrence. There are no extensive apiaries in the Argentine such as are to be met with in Texas, California, etc., and establishments of over 500 colonies are very few, indeed.

Foulbrood has, fortunately, not made its appearance yet, but considerable damage is done by the waxmoth. Apis Mellifera is singularly free of disease here, although no legislation exists to protect it.

Since Dr. Thomas Le Breton, late Argentine Minister at Washington, was named Minister of Agricusture, Farmers' Bulletins have been published, many of which are of interest to the beekeepers. In September, 1921 the first bee journal made its appearance, but as it was of a purely commercial nature, and funds running short, it ceased to be published in December of the following year. The present "Revista De Apicultura" is financed exclusively by beekeepers from all over the country who aim to promote the development of this industry as well as to place within the reach of everyone the modern teachings gathered from foreign publications, amongst others the American Bee Journal.

A National Beekeepers' Association is in process of formation, and the Revista will be its official organ.

A QUEER CASE IN BREEDING

By H. W. Earp.

WHAT is the test of purity of an Italian queen? I should say that the test is that every daughter raised from such a queen, if mated to an Italian drone, should herself be pure. What would you say, then, of a golden breeding queen, of whose daughters only a percentage, though mated to Italian drones are capable of producing workers showing the typical Italian marks?

Some years ago I purchased a golden breeding queen, and she was taken to a district where there were only comparatively few pure Italian colonies, but numerous black colonies. The workers produced by this golden breeding queen were, for the most part, what are known as yellow-all-over bees, except perhaps about 5 per cent, which were distinctly and clearly three-banded bees. About one hundred daughters were raised from the breeder, and the markings of the workers produced by the daughters were all typical of the Italian. The great majority of the daughters produced workers having a uniform three bands, and the remainder produced workers which approximated the color of the workers produced by the breeding queen herself. The daughters which produced yellow workers like their mother, I concluded, rightly or wrongly, were purely mated, and that those which produced only uniform three-banded workers were crossed with black drones, as black drones considerably predominated. As an experiment only, I bred from some of the daughters which produced the uniform three-banded workers, and as anticipated, obtained nothing but hybrid marked bees. In breeding from some of those daughters, whose progeny was yellow like their mother's I have had what appears to me to be a most peculiar experience. The daughters did not produce all yellow workers but some yellow and some three-banded, the ratio varying with the different queens. Some of the queens produced 95 per cent of yellow workers and some not much more than 10 per cent. Now the royal progeny, raised from any of these daughters, varied in color just the same as the mother's worker bees and in the same ratio; some being all yellow, except just the tip of the abdomen, and the remainder being what might be called a blemished yellow. In every case the workers produced by the yellow grand daughters are marked with the typical Italian marks, some queens producing yellow and three-banded bees, in varying proportions, and some uniform three-banded bees only as before, whilst the workers produced by the blemished yellow grand daughters are, without exception, hybrid. This experiment has been carried out to the next generation, with similar results which, briefly summarized, is as follows:

Queens which produce yellow and three-banded workers will produce yellow and blemished yellow queens in the same ration. The yellow queens so produced will in their turn produce the like, but the blemished yellow queens will produce nothing but hybrid. This has been tested out to the fourth generation. I may say the chain is incomplete in one respect, in as much as, at the first, not anticipating trouble, I have no record on any one of the breeder's original daughters producing hybrid marked workers, which, however, could easily be overlooked, owing to the breeder's percentage of yellow workers being as high as 95 per cent.

New Zealand.

(The editor has often noticed that Italian bees, bred for a number of generations, **for color**, have the color so persistent that hybrids do not show any black workers among them. But Italian bees, from Italy, such as that country produces, show the mixture at the first mismating. Some apiarists maintain that this proves that American Italians are purer than Italian Italians. But it only proves that we can breed an animal or an insect, **for color**, to such an extent as to keep the color almost fully in the progeny, even when mismated.—Editor.)

WORK OF THE EMPIRE STATE MARKETING CO-OPERATIVE ASSOCIATION

You will remember this Association as the one started in New York State by the New York Federation of Beekeepers' Societies. It has been doing well for the members. Practically all of the marketing business is managed by the Herschel Jones Marketing Service, of New York City, under the direction of the Board of Directors of the Association.

They succeeded in selling over half the buckwheat honey used in the New York market for the Jewish New Year holiday, and this stabilized the buckwheat honey market considerably so there was not the slump in price immediately following this special holiday trade such as there usually is.

Last year the Association honey was sold in ten different states, mostly to jobbers and wholesalers and bakery and restaurant supply houses, shipment being made directly from the producer in most cases.

There was also a small export business in clover honey and it was the expectation to develop this trade further the present year. The Association has established a reputation for supplying fine quality honey and the prospects are for a continually increasing business.

The plan of operation of this Co-operative Association offers a great advantage, since there are no overhead expenses and no obligations except as the honey is sold.

Cornell Short Course

A short course in beekeeping is to be given at Cornell University, Ithaca, N. Y., during the week beginning January 26, 1925. Being organized by Dr. Phillips, who is now there permanently, it cannot fail of being successful.

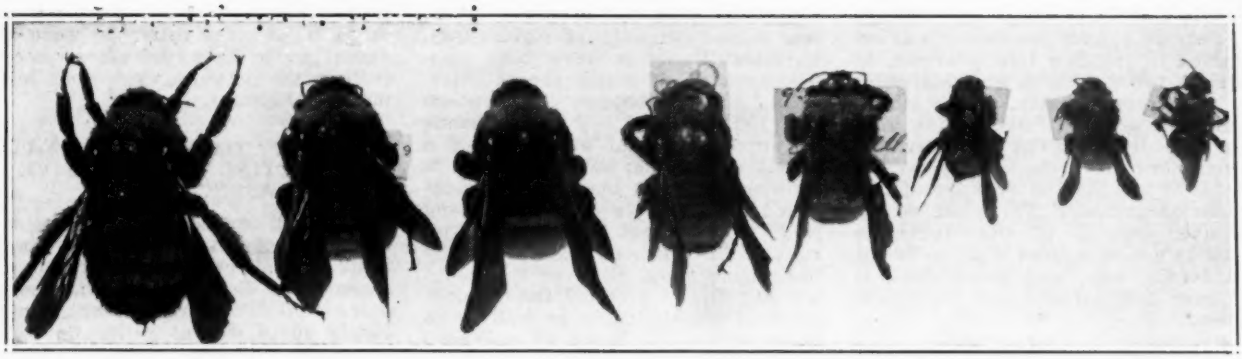
Our editor has promised to be there, at least a day or two, during the course. Details may be obtained by addressing Dr. E. F. Phillips, Cornell, University.

New Jersey Meeting

The annual convention of the New Jersey Beekeepers' Association is to be held at the Republican Club, Trenton, N. J., Thursday and Friday, January 15 and 16. Some interesting topics are on the program. New Jersey beekeepers should be sure to attend.

Wisconsin Beekeeping

"Beekeeping in Wisconsin" is the title of a 24-page Bulletin No. 174, published by the College of Agriculture of the University of Wisconsin, at Madison. If you live in Wisconsin, send for it. It is worth reading.



These are all females of the same species of bumblebee. The difference is due to feeding.

DOMESTICATING THE BUMBLE-BEE

Theodore H. Frison, Urbana, Ill.

IN 1910, I began a study of bumblebees and their enemies, and my investigations first involved a study of colonies started in spring or early summer in natural situations by free flying queens. Nests of bumblebees, therefore were diligently sought in the vicinity of Champaign and Urbana, Illinois. When a nest of bumblebees was found it was removed to a place where it might be studied at leisure. Many interesting observations were thus made and much light thrown upon the habits of our North American species of bumblebees and their associates. Somehow, curiously, it happened that when I started looking for numbers of bumblebee nests the search often became like hunting for the proverbial needle in a haystack and bumblebee nests seemed to be few and far between.

Many of the facts found out about certain species of bumblebees proved of considerable value in the locating of their nests. For instance, it was found that if I wished to secure the nests of certain common species of Illinois bumblebees I had to search for them in wooded tracts of land, whereas the nests of an equally common species were most frequently encountered in open situations. Even the kind of flight made by adult bumblebees was found to have its meaning, and it was often possible to determine from the character of the flight of a queen in spring whether she was merely looking about for a place in which to start her nest, or whether she was searching for a place which she had previously selected and had made her home. Nests were sometimes found, also by observing a "stream" of bumblebees going or coming in a definite direction and then taking advantage of this to ferret out the site of the nest. "Lining" the bumblebees, as is sometimes done in the case of the honeybee, did not prove practicable.

A situation where the grass surface-nests of field mice were common, was usually an ideal nesting place for several species of bumblebees, and this proved of great aid in the search for colonies. Charles Darwin has stated in his classic "Origin of Species" that bumblebees are more common about villages than in the more remote country districts. This statement was based upon the assumption that mice, or certain other small animals, were responsible for the destruction of many bumblebee nests and that this destruction was reduced in the proximity of villages because of the larger proportion of cats which destroyed the mice. The fact is, however, that queen bumblebees follow a line of least resistance in establishing colonies and diligently search for already prepared or partially prepared habitations in which to rear their brood. Nine times out of ten in the vicinity of Urbana, Illinois, this habitation is some kind of an abandoned mouse nest. Queen bumblebees can prepare a suitable habitation in some places by rearranging things to their liking and an abundance of mice nests—usually exceptionally well located—is a boon to the queens in spring. Accordingly, the benefits derived by the use of these nests often offset to a considerable extent the destruction by mice of small colonies of bumblebees.

Bumblebee nests were rarely found at their beginning, which seriously handicapped the study of important places of their biology. This led to experiments to determine whether the queens of North American bumblebees could be induced in spring to take up their abode and rear their brood in artificial domiciles. The finding and study of nests of bumblebees started under natural conditions, however, in spite of its limitations, is worth while because such studies have yielded a great deal of valuable information and will continue to do so. The fact that they supplement studies carried on under more or less controlled conditions is in itself an extremely valuable feature. A glance through the extensive literature of the subject shows that the numerous observations made concerning the habits of bumblebees by such famous students as Reamur (1742), the younger Huber (1801), Lepeletier (1836), Putnam (1864), and many others have all been the result of this type of study.

Atttracting Queens

The late F. W. L. Sladen, during his excellent studies of the bumblebees of England, was the first to obtain colonies of bumblebees by attracting the queens to artificial nest-boxes, and his experiments demonstrated the feasibility of this method. Three years after the publication of Sladen's well-known book (1912) describing these experiments, the writer undertook similar experiments.

The methods used to get free flying queen bumblebees to start nests in artificial domiciles are comparable in a general way, to the common practice of providing birds with boxes in which to nest. In the case of the bumblebees, however, it is necessary to go a step farther, and place in the artificial domiciles materials which can be successfully used by the queens in nest building.

A careful study of the places in which to nest selected by queens under natural conditions shows that all that is needed for an artificial nest, besides a shelter, to exclude light and prevent the exposure of the comb to the elements, is some such material as fine dry grass. The abandoned grass mouse nests so extensively selected by queen bumblebees in spring have nothing more to offer than that: dark interior chambers, a certain amount of protection from the elements, and soft materials such as old dry grass upon which to construct the first egg cells and honey pots. The type of artificial domicile used does not have a great deal to do with the success in attracting queens, as long as these essential requisites are provided to satisfy the nesting instincts.

During my first experiments in the spring of 1915 I used empty coffee tins or cans as domiciles. A large hole was made in one side near the bottom of the can to which was soldered, at an angle of about 35 degrees, a tin spout slightly over one foot in length. The free end of the

spout was then cut so that its edges were parallel with the top of the can, and the lid of the can was provided with a grip to facilitate its removal. Paint was poured down the inside of the spout and then sand or sawdust sprinkled through the spout before the paint dried. Some of the sand or sawdust naturally stuck to the fresh paint, and when this dried the combination of the two provided a good footing for any bumblebees which might climb down or up the inclined spout which served as an entrance to the domicile. A coat of paint was added to the entire contrivance to prevent its rusting when subjected to outdoor conditions. When the paint became dry a small quantity of soft, dry grass from the nest of a field mouse was placed in the can and then can and all were buried a few inches under the ground so that only the free cut edges of the spout leading to the can and nest were on a level with the ground. When properly buried no sign of the domicile was to be seen, and the entrance to it appeared as an opening leading to the underground nest of some small animal such as the field mouse.

Of a total of nine domiciles of this description buried in the ground in various places, in the spring of 1915, only one was selected by a queen bumblebee for her home. This one successful experiment, however, proved that the queens of American bumblebees can be induced to nest in artificial domiciles and encouraged me to undertake more or less similar experiments the following spring. Certain disadvantages of the domiciles as just described, became apparent at the close of these first experiments, such as the lids rusting on, excessive moisture collecting in the bottom of the cans, and the lack of a reliable supply of cans suitable for the body of the domicile.

In 1916, small tin pails, which could be obtained in numbers at almost any hardware store, were utilized for the bodies of the domiciles and each was provided with a removable glass or secondary top beneath the tin lid of the pail. In 1917, this style of domicile was still further improved by the substitution of a strong fine-mesh copper screen for the solid tin bottom of the pail, and as a result better conditions of humidity were secured within the domicile. This same year a small rectangular cypress wood box was used, which was provided with a hinged wooden top, a removable secondary glass cover under the wooden top, a fine-mesh copper screen bottom, and a tin spout shaped as before.

Without going into unnecessary detail, it is enough to state that about 60 per cent of domiciles used in experiments during the springs of 1916, 1917 and 1919 were selected by bumblebee queens for nesting quarters. Furthermore, a greater percentage of domiciles were chosen by queens each successive year. This is to be explained by the fact that the

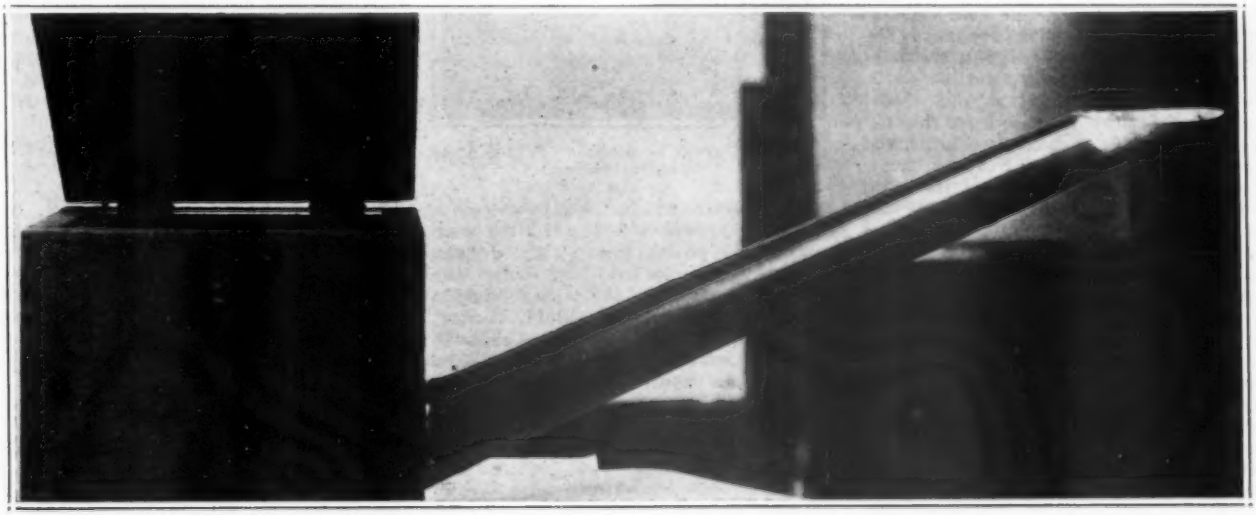
Wax-pollen pots used for the storage of pollen and honey.

domiciles last employed, better suited the instincts of the searching queens, and also in part to a better selection of places for the burial of the domiciles.

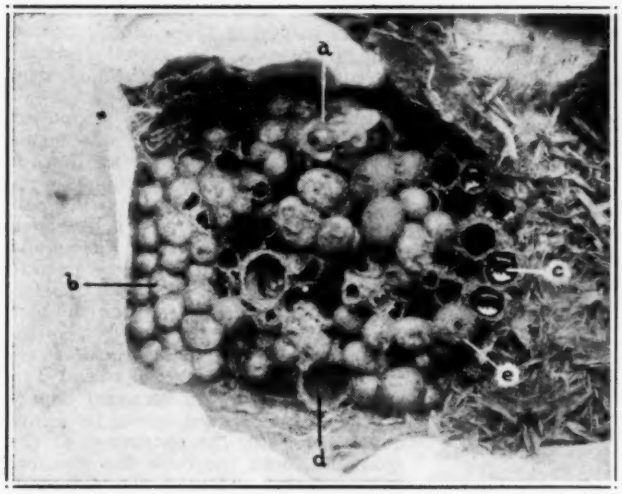
I have just mentioned that success in the attracting of queens to domiciles depends to a certain extent upon where the domiciles are buried. The proper selection of a place to "plant" a domicile hinges upon a knowledge of the kind of situations visited by the queens when looking for a nesting site, and upon the fact that different species of bumblebees select different habitats. Also, the domiciles must be put in the ground before or soon after the queens emerge in spring from their hibernation quarters. The actual time of the appearance of the queens varies with the lateness or earliness of spring, and also to some extent according to the species of bumblebee, for some species appear much earlier than others. After a domicile is buried in a likely situation and neatly covered over except for the open end of the spout, a piece of an old log, board or bit of hay may be laid with profit near the entrance. Queens seeking for a place in which to start their nests are exceedingly inquisitive and I have found that objects such as just named which stand out, somewhat, from the general aspect of the surroundings, serve to allure queens close to the entrances of the domiciles, and increase the chances of discovery. Though the domiciles were usually buried in the ground, by a slight modification of the spout, they were readily adapted for concealment in old tree stumps, logs, etc. Their use in such places was also quite successful.

Experiments in Rearing Colonies in Artificial Nests

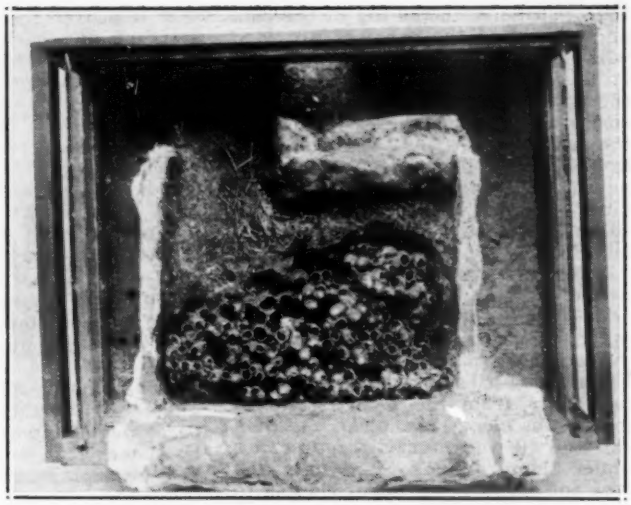
Previous to 1915 only two investigators had shown the possibility of getting bumblebee queens to start nests in confinement, namely, Sladen (1912), and Lindhard (1912). A short account of Sladen's method is advisable. He placed a queen, captured in spring, in a small box, provided with the requisites for nest making, and then supplied the confined queen with food. Sladen did not manage to get queens to start colonies when confined singly in this manner, even though the eggs were occasionally laid. He had somewhat better success by confining two queens in a common nest-box, but about the time the first eggs were laid, or soon after, one of the queens usually killed her companion and finally abandoned the nest. Sladen at last succeeded in rearing a colony when two or more workers, usually of the same species, were placed with



Wooden nesting box, in which a bumblebee colony makes its home. The glass top and hinged cover make observation easy.



Comb of **Bremus vagans** started in an artificial nest box by a confined queen. (a) queen; (b) cocoons; (c) honey pot made of wax and pollen; (d) pollen storage pots, also made of wax and pollen; (e) larval cells.



Nest of **Bremus impatiens** in a large observation nest at the close of the season. This colony produced over four hundred bees.

a queen starting to nest in confinement.

In 1917, for confining a queen, I used a small rectangular wooden box with a top of sectioned ruby or amber colored glass. In one end of the box a round hole was bored for an entrance or exit. This hole was kept closed with a cork and opened only when the colony was successfully started. Fine dry grass from the nest of a field mouse was placed in the end of the box opposite the opening. In the end of the nest box near the opening was a small container of liquid food for the imprisoned queens. In addition, a small lump of honey-moistened pollen was placed in the grass nest for use in making egg cells. Much to my satisfaction a colony of bumblebees was started and prospered in one of my boxes thus arranged, the first year that the experiment was tried.

Encouraged by these results, the experiments were continued for several summers. During all of this time the nest-box consisted, as before, of a small rectangular wooden box, with sectioned glass strips for a top and an entrance or exit hole at one end plugged with a cork. The materials used in 1917 for the nest proper were, however, not so satisfactory. The difficulties and observations of that year led to the development of a greatly improved type of inner nest. Several trials demonstrated that cheese-cloth could be substituted for the grass in the wooden boxes with great convenience to myself and a considerable saving of time. Finally, I found that honeybee wax could be used to good advantage in lining the cheese-cloth nests, something the bumblebees were otherwise prone to do themselves. Artificial honey pots, such as queens always make when establishing a nest under natural conditions, were also formed from beeswax—a pleasing substitute for the tin container used for supplying liquid food. In brief, the nest proper was a cheese-cloth chamber, lined with beeswax, in which was placed a lump of honey-moistened pollen to serve as the foundation of the comb, and a single honey pot of beeswax for the storage of liquid food. Such an artificial inner nest within the wooden boxes, protected from light, seemed to fulfill in every way all the requirements of the nesting instincts of a bumblebee queen. In fact, it reproduced conditions that are found in a natural nest only after days of patient labor on the part of the queen.

The liquid food supplied to the

Bumblebee eggs in position in the cells, (Highly magnified.)

queens confined in nest-boxes consisted of honeybee honey diluted with water. The pollen used by the queens in making their first egg cells was first obtained from the pollen baskets of bees captured in the field. Later, the pollen stored by honeybees in cells of brood frames was utilized and its use resulted in a great economy of time. In this connection, it is fitting to mention that the author is indebted to Dadant and Sons, of Hamilton, Illinois, for gratuitously providing him, in 1920, with brood frames containing a large proportion of cells well filled with pollen.

The queens used in my experiments were ones caught flying around out of doors. Before they were introduced into my nest-boxes, however, they were subjected to a preliminary treatment, gradually evolved, which caused them to become "broody." By "broody" I mean that the physiological processes going on within their bodies caused them to display characteristic nesting behaviorisms, such as the embracement of lumps of pollen and their excited buzzing and agitated movements when disturbed. Furthermore, the production of wax became evident. In order to bring about this desired "broody" condition, the queens were placed in large aquarium jars, exposed to ordinary illumination, and liberally supplied with dilute honey and bits of pollen. As soon as a queen became "broody" she was then removed to one of my artificial nest-boxes.

During the summers of 1919 and 1920 the writer carried on many experiments in the rearing of colonies under controlled conditions in the manner just described, and highly gratifying results were secured. Colonies were obtained by placing two queens in the same nest-box, by providing a queen with workers caught in the field as Sladen had previously done, and furthermore by the introduction of a single "broody" queen into a nest-box without the assistance of workers or the competition of another queen. To be exact, by the improved methods used in 1919 and 1920, 77 per cent of the attempts to induce queens to rear colonies under controlled conditions were successful, and a method was developed of great usefulness in the study of the biology of these interesting relatives of the honeybee.

The success of the methods perfected for rearing colonies of bumblebees from queens captured in spring in the vicinity of Urbana led to experiments in the shipping of live queen bumblebees through the mails. My studies along this line demon-

strated that queens could be safely shipped in certain kinds of containers for long distances by mail, and this opened up the possibility of studying the biology of species not found near Urbana, Illinois. Queen bumblebees were received alive in specially constructed mailing boxes from New Mexico (J. Woodgate), New York, (Hugh Glasgow), North Dakota (O. A. Stevens) and Massachusetts (C. A. Frost and E. J. Smith). Some of these queens produced colonies in my nest-boxes, proving their vitality was not seriously weakened by shipment.

Experiments in Controlled Fertilization and Hibernation

In the fall of 1916, 1917, 1919, experiments were conducted to find if I could secure the mating of queen bumblebees and under controlled conditions; something thus far not successfully accomplished in the case of the honeybee. The queens used in these experiments were ones reared from colonies in my observation boxes (colonies successfully started in nest boxes and later transferred to larger observation boxes). The males were obtained in the same manner as the queens or collected from flowers out of doors. Without going into detail concerning the methods, which will be reported upon elsewhere at greater length, it suffices to state here that I was very successful in getting males and queens of various species to mate under controlled conditions. Of sixty-four experiments of this nature (in several experiments as many as thirty queens were used in one experiment), thirty-two resulted in observed matings and no doubt many matings occurred in other experiments that escaped observation and recording.

During the years of 1917, 1918 and 1919, a series of fifty-three experiments demonstrated that queens could be successfully hibernated, provided the queens were fertilized and natural conditions of hibernation duplicated. Three species of queens placed in hibernating quarters in fall were carried through the winter and resumed activities in spring when they were exposed to warmer temperatures.

Conclusion

A summary of the experimental data briefly presented in this article shows that the queens of bumblebees can be induced to start and rear normal colonies under controlled conditions. Furthermore, mating of the males and queens can likewise be brought about under controlled conditions and the queens successfully carried through the winter. When we consider that, in the case of the honeybee, we have yet to perfect methods by which fertilization can be controlled, there is some justification for the statement that the bumblebee—commonly considered one of the "wild bees"—can be domesticated in a more narrow sense of the term than the honeybee.

The development of methods for rearing bumblebees under controlled conditions, aside from the opportunity it affords for general biological studies opens up fundamental problems which have a direct bearing upon many of the problems of the beekeeper and the professional student of bees. Furthermore, there is the fascinating possibility that the bumblebee may be made of more service to mankind by continued controlled selection and rearing.

MEMORIES OF L. L. LANGSTROTH

No. 3

By C. P. Dadant.

I DID not preserve a memorandum of the exact date at which Mr. Langstroth came to Hamilton to make arrangements concerning the revision and re-publication of the "Hive and Honey Bee"; but I have under my eyes a letter from him, dated October 2, 1885, speaking of his intended visit; then another of October 12, in which he speaks of having returned home "on time." So he must have come to Hamilton about the 8th of October. It was the intention of Mr. Muth to accompany him; but at the last minute Muth could not leave. It would have been safer, had he come with him, for on the trip, a pickpocket robbed Mr. Langstroth of his wallet with the few dollars we had sent him for the trip. The dear old man was entirely unaccustomed to deception and told us with great ingenuousness how a very fine man had sat by his side, for only a short distance and, said he, "I am quite sure of the minute when he must have picked my pocket, for he leaned over across me to look out of the car window, and called my attention to some trifling thing outside, just as we were about to stop at the station at which he got off. He crowded me a little and I am sure that must have been the time when he took my pocketbook."

During his stay with us, we desired to show Mr. Langstroth our methods of extracting. The work at the home apiary was all finished, for the season. So he accompanied me at an outapiary, some five miles from our home; a crew of men being at work there. We went in the afternoon and spent an hour or so with the men. He went from the apiary to the honey house, which was also a milk house, and back again to the apiary. He watched everything very closely, but made no remarks. At length, on the way back to our home, in the buggy, after quite a space of silence, he said to me: "A man may leave an occupation for fifteen years and imagine that he can take it up where he left it, but he cannot do so; for he finds himself away behind." It was no wonder that he felt himself so much behind, for he had done no work in a producing apiary for years. He had not even worked upon his book since 1859; so he had written us in his letter of October 2. The great improvements secured by the honey extractor, comb foundation, bee smokers, pound sections, etc., had never been used by him, though he knew well about them.

The arrangements then made between us were hardly sufficient to give us free action. We were to take the responsibility of revising the book, taking his advice, and would consult him as to a publisher. Translations were not even thought of by either side. We were to pay all the expense and pay him half of the net proceeds. But as he was always short of funds, we advanced him at once a sum of money, which he took the pains of putting in a draft for safe carriage, outside of the amount he needed to return home.

There was a large amount of correspondence between us shortly after that; in fact fifteen letters were received from him between October 14 and January 6. Let me give a few extracts from some of them:

October 29.—I enclose a letter from Mr. Alley. I feel the importance of being very cautious about endorsing new things. (He was speaking of the Alley System of Queen-rearing). Personally I should see my way clear of speaking of his book as the highest authority in queen-rearing. . . . I have been able to do nothing of mental work since I came home.

November 4.—I presume you will agree with me always to give credit to all from whom we borrow. . . . (We did. It keeps one at peace with the world.)

November 9.—I highly approve of your idea of a chapter on bee physiology. . . . (We took most of it from Cheshire).

November 17.—In making suggestions to you, please bear in mind that if they do not meet your views, there is no need that you should give me any reasons for not acting on them. . . .

November 20.—The more we interchange views, the better I am satisfied that you are on the right track.

November 30.—I leave tomorrow for Rochelle, via Dayton, to see my youngest daughter, and expect to be in Detroit a week from today. Be sure if possible to be there. I don't get down, nor do I get well enough to do much. . . .

This last letter referred to the American Beekeepers' Congress, which met at Detroit on the 8th-10th of December. I was there with him, and it was at this Congress that James Heddon began the work he undertook of convincing Mr. Langstroth that he, Heddon, had invented a better hive than the Langstroth, by far the best hive in the world. Heddon was an excellent speaker. He had just invented his hive, of which some of my readers may have perhaps heard; it was reversible, in two shallow stories, with close-fitting frames,

adjusted together with lag screws, and of course he considered it the acme of perfection. At the Convention Mr. Langstroth, who had been sick so long, and unable to attend meetings or even meet beekeepers singly, was given a most delightful ovation. He was literally lionized and deserved it. He enjoyed it hugely. Heddon, in making a speech on beekeepers' rights, addressed himself personally to Mr. Langstroth and everybody was pleased.

On his return home, Mr. Langstroth wrote us a very long letter, out of which I clip the following:

December 18.—No doubt that both financially and commercially the book ought to appear at as early a date as possible, but haste and inaccuracy would damage us ever so much more than delay. (We agreed to that heartily.) I deeply regret that my part lags so much behind. What I do just now is all forced. . .

Finally, on January 6, 1886, he wrote us:

I am sorry not to be able to report some progress. I am struggling against the encroachments of that dread disease, and still hope to throw it off. I can only say, go on with your work, and when I am able—if ever I am—I will take hold again.

After that and until the latter part of the year 1887, Mrs. Cowan, his daughter, took care of what little correspondence passed between us.

Well, we found ourselves compelled to continue the revision independently. This might be a good place to tell how much of the work of Mr. Langstroth is to be found in the revised book. At first about two-fifths was his. It is the finest part of the work, for Mr. Langstroth had a delightful way of expressing himself, and his "sermons"—if I may employ that expression—were always well brought out and written in a pleasant tone. Now, with all the changes which we have had to make, and additions which progress required, probably less than a third is the work of Mr. L. In the French edition we placed all of Mr. Langstroth's work in light parentheses and we are sorry we did not do this in the English.

But during these two years, another trouble came. We had a disagreement with Mr. Cowan, Mr. Langstroth's son-in-law, concerning the publication of the book and its translation. It was impossible to get Mr. Langstroth's decision. So we resolved to do nothing more about the publication of the book until Mr. Langstroth recovered sufficiently to make another contract, giving us entire control of the copyright, and of the translation into other languages, for an annuity to be paid to him as long as he lived, instead of a share of the profits. Profits were far away in the future, and he was in constant need of money. This contract was signed December 8, 1887.

Like many great men, Mr. Langstroth had but little appreciation of the value of money. He did not handle much of it, it is true, but when he did have money, to state it as one of his friends did: "Money went through his hands like water through a sieve."

The most striking example of disregard for money which I can quote is that of a great writer of fiction and poetry of the middle of the 19th Century, Lamartine. Lamartine's works were worth thousands of dollars and he was a profuse writer. He sold several of his best works at one time to a publisher for some fifty thousand francs. In spite of this and of the fact that he had married a very wealthy woman, he managed to squander his fortune in a very short time. Shortly after this fortunate sale he decided to take a trip to the Orient. He chartered a ship on the Mediterranean, landed at Beirut with his wife and daughter and a retinue of servants, rented six houses in and around Beirut, and organized a caravan to visit the Lebanon and Jerusalem, with some 20 or 30 people and as many horses. Of course it would take a millionaire to succeed in keeping up such expenditures; so he died in poverty.

On a limited scale, Mr. Langstroth had as much disregard for money as did Lamartine. The money we paid to him appeared to do him no good at all. We had to regulate our payments to certain dates; then in order to get the money a few hours more promptly he would have it sent by telegraph. Such lavish use of the small funds we paid him could not do him much service. But how can we put blame on a minister of the gospel who follows the injunction to "have no thought for the morrow"? There is perhaps more evil in the modern economy of money, than in the lavish use of it!

The events which I have just mentioned delayed the publication of the "Hive and Honeybee" until late in 1888. Meanwhile, we took advantage of all the progress then being made, from time to time. But we were yet too early for the Doolittle System of Queen Rearing, which was described by him at about the time when our first revision was published. It was inserted only in our second edition of the revision. But we gave the Alley method, which was very good for that date, but upon which Mr. Langstroth had hesitated, as one of his letters has shown.

In March, 1888, Heddon, who had corresponded with Mr. Langstroth whenever the latter was able to write, invited him to come to his home, in Dowagiac, Michigan, and see his hive.

It may be necessary to state here that the Heddon hive was patented and that its recommendation by its inventor and by Mr. W. Z. Hutchinson, who began the publication of the "Beekeepers' Review" about that time, created quite an excitement. Mr. Hutchinson, a very capable writer and publisher, was a pupil of Heddon and followed his lead in many things. The possible addition of Mr. Langstroth to the panegyrists of the famous hive was expected by them to bring about a complete change in the use of hives in the beekeeping world.

In the last days of March, 1888, Mr. Langstroth, who had recovered during the previous fall, wrote us that he was going to Dowagiac, to be the guest of Heddon, and that he would write us from there. He did. He remained there almost a month, for he wrote us letters from the Heddon home, April 5, 20 and 27. The letter of April 20 informed us that he was sending an article to the American Bee Journal, to describe the Heddon hive and show its advantages. This letter, published on page 294, May 2, 1888, of the American Bee Journal, is dated from Dayton, Ohio, but was actually mailed from Dowagiac, and without doubt, Mr. Heddon suggested the tenor of it. The evidence of this, to us, was in the letter we received, written at Dowagiac, in which Mr. Langstroth said:

"You will soon see, in the American Bee Journal, my reasons for thinking the Heddon hive a step in advance. You will understand that they must have appeared very weighty to me in order to make me **prefer his invention to my own.** Well, in this matter, Father Time must tell who of us is right."

Father Time **did tell** who was right. Heddon went entirely out of the bee business long before he died in 1911, and there are probably not fifty people in the world today using the Heddon hive or a hive similar to it, though quite a number use the shallow stories in brood chamber.

The approval of the Heddon hive by Mr. Langstroth called forth all sorts of comments. His letter of praise, for it, was also published by Gleanings, for Heddon did not wish to leave a stone unturned. It brought a protest from A. I. Root. Dr. C. C. Miller wrote us: "Mr. Langstroth did a cruel thing to himself when he declared the Heddon hive to be superior to his own invention."

But Mr. Langstroth had not always thought that of the Heddon hive, for he had written us on the 9th of November, 1885:

"Shuck sent me a copy of his patent and I send you his letter. (Shuck was the inventor of a reversible hive similar to that of Heddon). Treat all its contents in confidence and return it to me. I do not think Heddon would like to have anything said about his patent. It seems strange to me that he should want to go back to the Huber principle."

Huber's hive has been called the leaf hive, and all its frames were tight-fitting together like Heddon's.

In spite of the feeling that we had that the invention of Heddon was only one of the still-born discoveries of which there are millions, we gave it a place in the Langstroth revision, paragraph 727. But my father could not be prevailed upon to include it in the French translation, as he asserted that it would never become popular. He proved right in this as in many other matters of bee lore. We dropped it out in later editions.

After this most extraordinary occurrence, Mr. Langstroth retained his health, but he no longer occupied his mind with a constant thought of bees and beekeeping; his thoughts of it were only occasional, as for instance when he attended the Toronto meeting of September, 1895; his last appearance among beekeepers. This was perhaps why he retained his health, since constant attention on the subject of bees and hives had been a strain upon his brain. His letters to us became more and more infrequent, not more than one or two a year, instead of that many a week. As most of our readers know, he died, at 85, on Sunday, October 6, 1895, in the pulpit, just as he began addressing the audience, without any premonition of his approaching demise.

Before closing these recollections, let me say that our old friend was very tolerant, not only in religion, but also in the matters which most worried him, his inventions. Although he considered that the Quinby hive was an infringement upon his patent, he often said that he would not under any circumstances find fault with Mr. Quinby, for Quinby was not trying to make any profits, selling patent rights. On the other hand, the men who, like H. A. King, took patents and tried to make profits by selling hives, were considered by him as infringers to be relentlessly prosecuted. Mr. Quinby acknowledged publicly the priority of the Langstroth invention, when he wrote in his book, 1866 edition, page 66: "To the Rev. L. L. Langstroth belongs the credit of introducing to us the hive that will accomplish all these desirable results. . . . "A little farther along he wrote: "I will give a full description of making one, modified by myself from Langstroth's being much more simple. But he claims that it is not changed sufficiently to be released from his patent. I am not lawyer enough to decide the point, nor whether the other patents for movable combs are infringements upon his."

MILK AND HONEY

(Translated from original manuscript in German by George E. King, University of Illinois).

HOW did milk and honey become related? Dr. Metchnikoff, the famous Russian investigator, who lived in Paris and did such distinguished work in the department of nutritional physiology, once investigated the cause for the longevity of the Bulgarian peasants. In no other country in the world do people become so old on the average as in Bulgaria. In single hamlets there may be found a number of people who are over 100 years old.

Professor Metchnikoff found that the Bulgarians attribute this to the peculiar properties of their sour milk, and their extraordinary care for their health. Bulgarian sour milk is whole milk thickened by cooking and the addition of a little culture of Bacillus bulgaricus, a milk-souring bacterium native to Bulgaria, holding it for a long time at the temperature of the human body (36°C), under which conditions the bacteria multiply rapidly. Professor Metchnikoff carried out many years of investigation in the employment of this milk for the human body and found that it promotes the human well-being most especially if it is eaten in connection with dates. It brings about then an especially desirable bowel-flora which influences the digestion favorably.

My brother-in-law, Mr. Max Ullman, of Grez, in Styria, has for many years lived in Africa in the native home of the date palm. He related to me that date buyers and merchants lay the dates in honey and then pack them in transportation chests. We therefore see that milk and honey are counted together in Bulgaria, and produce very excellent results.

The results of tests upon the efficacy of a honey and milk diet in the treatment of children in the Frauenfelder Home for Children, in Switzerland, are absolutely startling. In Amden, in the Canton of St. Callen, in Switzerland, there is a sanitarium for children, where weak and sickly children are brought by their parents to recuperate and gain health. It was in this institution that a large number of children were for the first time placed on a diet of honey and milk, with the best of results. The Frauenfelder Home for Children, so named after its founder and owner, has now published the results attained by this highly successful treatment.

With her excellent honey crop and its fine quality, America still suffers because of the difficulty in marketing this noble product. The outlook for the marketing of American honey will brighten in a twinkling if beekeepers and apicultural organizations will make known everywhere the wonderful success of the Frauenfelder honey and milk diet, and will interest mothers, and, above all, the **medical profession** in it.

A strenuous effort should be exerted to have American children's sanitariums, convalescence wards, or hospitals for children try out the honey and milk diet in accordance with the Swiss method. If this is done American beekeepers will have no more need for anxiety. Honey production will not supply the demand, for, instead of the syrup or molasses pot the honey dish will find a place on the dining table of every family.

If the actual facts become understood, the result is certain. No. 3 of the "Schweizerischen Bienenzeitung" for the year 1923 gives us a statement from Mrs. Dr. Paula Emrich, the home physician of the Frauenfelder Home for Children, from which we take the following:

"Before being admitted into the Home for Children each child, for 14 days, is closely observed in regard to its health. Especially those children in whom sickness became manifest **during the school season,** or those who during convalescence or through general weakness had dispensed with attendance at school for several weeks or months, afforded the greatest opportunity to ascertain the specific effects of the honey and to observe developments. Those children who came for the treatment during vacation and for the most part were anaemic or nervous, were already strengthened or entirely well after a few weeks in the Home.

The scheme of investigation embraced questions as to body-size, weight, haemoglobin content of the blood (Hb.) and breast circumference during the deepest inhalation and strongest exhalation, in which the general condition of the glands, lungs, circulatory system and also the psychic behavior to the minutest degree, were taken into consideration. The daily observation of the children likewise rendered feasible the making of a representation of their psychic interruptions.

In the eyes of the parents, the things of most value were the records of blood counts and weights. A treatment by which a child with about 60 per cent Hb. and 29 kg. in weight after the expiration of six weeks showed 82 per cent Hb. and weighed 31 kg., is a good treatment. But when the doctor besides taking as an objective the measurement of the lung capacity and enhancing of the appetite, can bring about the gradual elimination of the often endlessly multitudinous nervous symptoms, then it must be wonderingly asked how such a result was possible in this incredibly short time. Naturally honey alone is not the magician, which has effected this wonderful cure, but the fresh mountain air, the complete rest and with it the intensive living in the open have essentially contributed to it.

Two children who were placed under rigidly similar experimental conditions, the one on a honey diet while the other was allotted a corresponding quantity of milk, showed unequal development, to the credit of the child dieted on honey. The children were brothers. The results of the test were definitely ascertained to be as follows:

At the outset the smaller one had 53 per cent Hb. (was fed on honey).

At the outset the larger one had 70 per cent Hb. (was fed on milk).

When released the smaller one had 82 per cent Hb. and had taken on 1 kg. in weight.

When released the larger one had 78 per cent Hb. and had taken on 1 kg. in weight.

Many parents are often astounded at their child's poverty in blood and the nervousness due to it. But dur-

ing a short time while they are growing rapidly some children do to some extent become blood-poor."

(At the University in Halle on the Saal in Saxony, Germany, it has been observed repeatedly that children nourished on milk whey were always anaemic. In the clinic for children in Copenhagen, Denmark, it was conclusively shown, that the fatty acids contained in the milk whey dissolved the red blood corpuscles. Therefore no milk whey for youngsters and children!)

In the beginning they have a hearty appetite and great need for sleep, later they are sooner weary than hungry, willing rather to sleep than to eat. The child continuously becomes more anaemic, school weary and nervous, and finally suddenly breaks down. Such a child urgently requires the honey treatment, especially in connection with good air and a prolonged sojourn in the open. Children who are weak, nervous and anaemic ought even to be taken out of school. Besides, at the Frauenfelder Home for Children it has been their experience that the case is quickly controlled by them, if the child is invigorated by means of the honey diet.

The administration of the honey treatment in the Frauenfelder Home for Children is conducted in the following manner: The honey is given to the children in increasing doses (one-half teaspoonful to one tablespoonful twice daily) in warm, but raw aerated milk, without any other medicant or victuals. Parents who brought their children to the home repeatedly had medical statements advising that the child must not be put on a honey diet, because honey caused stomach-ache. But thus far it could not be confirmed that a single one amongst the 200 children displayed any irritating effects whatsoever on the digestive organs. Naturally if taken as food in copious quantities, honey might possibly evoke disorders, still with the maximum dose of one rounded-up tablespoonful of honey in milk, given to the children twice daily, this was never the case.

Now to what is the good effect of honey to be attributed? In its composition honey contains 15-20 per cent water, 70-75 per cent sugar, small amounts of formic acid, fats, salts, iron, lime, ethereal oils and pigments. The same amount of sugar solution, if also mixed with the constituents that usually are contained in honey would by no means produce the favorable results that honey does.

The investigations of late years, first gave a glimpse into the deeper relationship of nourishment to the structure of the body. A student of Bunge, a distinguished physiology professor, in growth tests, fed milk to mice, upon which these developed well. He afterwards fed them a mixture of casein, fat, sugar and salts, closely corresponding to milk, upon which, after a few days, they succumbed. This mixture lacked the vitamines, those substances so important to life, that previously were entirely unknown but must have been present in the milk. It was later confirmed that vitamines are present in every raw unadulterated natural product. It is still uncertain whether the vitamines represent indispensable building materials for certain cells of the human body, or whether they exert an influence upon the metabolism by functioning only as a ferment. But their absolute necessity for metabolism is certain.

In the opinion of Mrs. Dr. Emrich, the Home doctor of the Frauenfelder Home for Children, the good result from the honey treatment is to a great degree to be attributed to the vitamines contained in the honey. These organic substances are very thermolabile, i. e., they become destroyed at high temperatures.

This, too, is the reason why the honey should not be placed into boiling milk, but only into lukewarm milk. The temperature at which the vitamines disintegrate is below the boiling point of water, consequently in all cooked foods they are destroyed. The vitamines occurring in lemon and orange juice, in raw fruits, in honey, in cod liver oil, and in malt preparations are entirely preserved and unadulterated. The vitamines, the three kinds of which are designated as A, B and C, represent a special indispensable class of food materials. If they are absent from the food, conditions of a distinct nature arise, commencing with a simple loss of appetite, languor and weakness and culminating in the severest illness, as is the case in Barlow's disease (Infantile Scurvy) of the child in the first year of its life, or in the scurvy of polar travelers, who during months at a time have to dispense with all fresh provisions and subsist only upon preserved foods.

In the Home, the children who, because of their parents' wishes, are required to take malt preparations instead of honey, advance in their health and development much more slowly than do children who take the honey treatment. But even in the last weeks of their stay for treatment, as expected in these same children, there was an immediate increase in the haemoglobin content of the blood, in proportion to the honey given them with milk, and there also resulted a gradual increase in their appetites and strength generally. With nearly every child, **one** point was noted, namely that in the course of the first few weeks the haemoglobin content (Hb.) of the blood, at first below normal, increased, and after some time an increase in body weight also resulted. It can then be admitted that not until after several weeks do children show an increase in weight, after which time the haemoglobin content of the blood has often increased 20 per cent or more. From this it had to be concluded that the children were not overfed, but that the improvement took place in the principal constituents of the bodies in the blood itself and then the material added to it made its way out from the haemoglobin-enriched blood. By reason of this it may be that the time required for results is probably dependent upon the blood exerting itself directly for the restoration of health, accomplishing this by the formation of new blood corpuscles. It is also certain that the greater proportion of the cures of children of tuberculosis, pleurisy and peritonitis, and from obstinate bronchitis, is due to the increased resistance by the bodies of the children examined.

With the further growth of the vitamine doctrine the pharmacists and physiologists also will certainly become occupied with the problem as to the action of honey on the organism. At present it is fully demonstrated that a certain blood-building effect is to be attributed to honey and that as a consequence there results a wholesomeness to the blood as well as the purification of the body from diseases of every kind. The investigations by the Home advisor, Professor Dr. Rubner, of the University of Berlin, an acknowledged nutritional physiologist, have proved that bee honey **contains** the growth-promoting **Vitamine B in abundance.**

The Fraunefelder honey treatments, which can be characterized right away as **wonder-treatments,** are well adapted to open the way for our noble bee product into every home. It must have occurred to us at first, from the scriptural declaration by the prophet Moses, that milk and honey evoked these excellent curative properties. Humanity has known the superior value of milk and honey, but yet not of the value of these substances together for the promotion and maintenance of the health of the human body. The supplementary effects of the vitamines in the milk and honey together probably play the leading role in this.

It naturally now is up to the American honey producers to make these magnificent results serviceable in the betterment of the honey markets. Up to this time Americans have shown a masterly understanding of new inventions and discoveries of all kinds and have quickly applied them to usefulness in every branch of activity. It would be regrettable if the results obtained at the Frauenfelder Home for Children should not arouse the interest of the American medical profession and in particular the supervisors of hospitals for children. If parallel tests of a similar kind were made in America, the results of these tests would reveal similar favorable results, then it would perhaps lead to a general preferring of honey dissolved in milk to children, and honey would again acquire the significance in the household and in the nursery that it already had in the gray dawn of antiquity.

The great sugar requirement of the human body, in particular for the growth of the child, would undoubtedly be gratified better and more correctly by means of giving honey than by candy, which causes disorders of the teeth and stomach. The nourishing of the child's body should be in

accordance with nature with unadulterated raw natural products. A distinguished English physician made a declaration which in the last year has gone the rounds of the illustrated American periodicals. He said: For their healthy growth children require two things—sun and milk. On the basis of the wonderful results of the Frauenfelder Home for Children this declaration can be amended: For their healthy growth children require three things—SUN, MILK and HONEY.

SOME PACKAGE EXPERIENCE

By Jesse L. Tillinghast.

SINCE Mr. Jes Dalton brings up from time to time phases of the package bee business from the shipper's point of view, I thought I would extend a few impressions from a receiver's point of view.

During the past two years I have received package bees from several beemen of the South. The first package came from down in central Texas, arriving May 10. They were sent on sugar syrup and arrived in excellent condition. There were less than a dozen dead bees in the cage. On being put into a hive they began to work zealously at once. Similar results were acquired from another shipper in Texas who also sent his bees on sugar syrup. Packages from Florida and Louisiana containing one or more frames of bees, honey and emerging brood, arrived in a fairly good condition, but it was a long time before they went to work with religious fervor.

Packages from Mississippi and Alabama, shipped on honey-sugar candy invariably arrived in about a half dead condition. Practically the same was true where bees were sent on pure honey or sugar candy for feed in transit.

Bees sent to me with sugar syrup for the feed always arrived here in good condition.

My views, as a receiver of package bees, might be summed up as follows:

(1) The package should be filled with young bees and not those wintered over.

(2) The bees should be well fed before shipment by smearing sugar syrup on the outside of the package until the bees will consume no more.

(3) Ship on sugar syrup only (equal parts of sugar and water to which has been added a little tartaric acid to prevent granulation) in a friction top can inverted over the bees with two or three small holes in it.

(4) Be sure the queen shipping cage (preferably the six-holed type) is securely fastened to the top of the package over the cluster.

(5) Have the package made strong enough to stand shipment.

I agree with Mr. Dalton in that the shipper is not entirely responsible for the arrival in bad order. The express companies here do not keep bees in a ventilated room, neither do they exercise care in handling. They simply toss a consignment of bees around like so much dunnage. Mr. Dalton's recourse to an attorney is all well enough, but what is wanted is a damage suit of a few thousand against the express companies which will result in their requiring all employees to handle bees carefully.

I really believe that package shippers would receive a great deal larger volume of business did the express companies handle bees more carefully.

Associated with this would also be great care in preparing all packages.

We New York State beekeepers are rather jubilant over the fact of having Mr. R. B. Willson and Dr. E. F. Phillips to battle for better apicultural conditions in New York State.

(We are glad to say that the express companies are beginning to realize the importance of the bee shipping and that it may not require expensive lawsuits to secure their cooperation with the shippers and purchasers of bees. Safe arrival is to their interest as well as ours.—Editor.)

King Alfonso, of Spain, in the center, dons a bee veil on the estate of the prince of Asturia. They are all afraid but the prince himself: Puzzle: Find the prince.

HOW TO EAT HONEY

The "France Apicole" sent the following question to a number of subscribers: "In what shape do you prefer to eat honey"? Of 272 replies the different tastes given were as follows:

With bread and butter	103
With bread	59
In gingerbread	57
In natural condition	26
With milk and coffee	12
With cocoa	7
In comb, natural shape	3
To sweeten milk	1
With cream cheese	1
With nuts	1
In a honey omelet	1
In candy	1
Total	272

Twenty-six prizes had been offered and were distributed among the best descriptions. Three recipes were published, as follows:

Honey Omelet. For six persons take ten eggs, break them into a dish, whip them well, add a little cream, salt and a bit of pepper if you like it. Heat butter in a frying pan, when it is hot, throw in the eggs, cook on a quick fire. When it is still soft, put it in an earthen dish, put on a thick coat of honey and fold the omelet. A few minutes in the oven will finish the baking and will melt the honey.

Velvet Cream with Honey. Add to a cream cheese about one-third of its volume in honey, mix carefully, adding a teaspoonful of kirschenwasser. Serve after ornamenting the preparation with preserved cherries and candied angelica. (Not a dish of prohibition countries).

Milk-apple-honey. To a cup of warm milk, add a grated apple and a tablespoonful of honey.

THE EDITOR'S ANSWERS

When stamp is enclosed, the editor will answer questions by mail. Since we have far more questions than we can print in the space available, several months sometimes elapse before answers appear.

BROADCASTING SWEET CLOVER

Will it pay to sow sweet clover seed broadcast over creek banks and waste places? There is some rich bottom land along a creek near my bees. Will the clover crowd out the weeds, and when should it be sown, on a snow this winter, in the spring, or fall? OKLAHOMA.

Answer.—Yes, it will pay to sow sweet clover seed broadcast, on waste land, provided that waste land has some lime in its soil. You will notice that the sweet clover will grow better on the soil of old stone quarries than on very rich loam, if that loam does not contain any lime and is sour. But it will cost very little to try it anywhere. It will kill all weeds when it becomes well established in the soil and will prove very good for honey production, besides furnishing abundant pasture and reclaiming the land that is in ditches from over cultivation.

Sow it as early in spring as you can. It does not hurt it to stay over winter in the soil.

BEES BEING STOPPED IN FLIGHT

The November issue is very good. Mr. J. E. Crane's article on "Overstocking," page 517, is very interesting and it is in line with my own experience. One paragraph raised the question in my mind: Do bees on long flight, loaded, stop to rest on the way? And was that what caused so many to drop in the lake? In this country where poisoning cotton kills many bees, some farmers poison and some do not. It is noticed that one stand of bees will die from the poison and another right by it will prosper, indicating that the bees from that visited only the field which was not poisoned and the other only the field that was poisoned. So that the bees mentioned in Mr. Crane's article, being moved, now found pasture in that direction sufficient to keep them busy, and did not cross the lake again. Therefore their wings were not worn out so quickly.

I have always had the impression that bees leaving the hive did not stop for anything except to gather supplies for the hive and once loaded made straight for the hive, and did not stop for anything on the way.

Would a two and one-half-mile flight be so great as to cause a depletion in the amount of bees in the hive, with the queen laying as she surely would with a honey flow on as indicated by the article? TEXAS.

Answer.—Very probably the cause you suggest is one of the causes of bees dropping in the lake. Bees may become tired, or by a sudden gust of wind may be blown down. If they are on land, they pick themselves up; but if they are over water, they are done for.

There may be something also in the glare of the water, when the sun shines upon it. A bee flying over the water may be dizzied by it, when the distance is great. We used to have bees within a quarter of a mile of the Mississippi river and it shortened the pasture considerably. We had a friend living at Keokuk, right at the edge of the bluff of the Mississippi, and I often noticed bees flying across and also saw bees resting on the bridge, which was almost on a line between his house and the Mississippi bottoms, which were covered with flowers in the fall.

A man living on the west side of the river told me that whenever swarms crossed the stream, they would land very promptly after reaching the Iowa shore; but nearly every one of those swarms proved to be queenless. Evidently the queen got lost in the crossing of the stream As it is only a mile across, and as swarms are known to fly a great deal farther without stopping, I took it for granted that the queen was dazed by the sun glare upon the water, in most of these cases.

There is much room for discussion on these matters.

NORTHERN MICHIGAN

I wish to know concerning the cut-over lands of the northern part of the southern peninsula of Michigan as a bee country.

Also what honey plants form the surplus and about the average surplus you can expect? MARYLAND.

Answer.—The best description we have of the resources of Michigan is in the December 1922 number of the American Bee Journal, by Prof. B. F. Kindig.

The main honey plants of the cut-over lands are wild red raspberries, willow herb or fireweed and several kinds of milkweed. There are other flowers, but those are the main ones.

As to the amount of honey to be expected, this varies so much according to the location, the season and the care given to the bees that it is out of the question to give a correct reply.

All in all the cut-over lands of northern Michigan are certainly favorable to beekeeping. The main point, if you wish to establish yourself there, is to avoid going into an already settled territory. Overstocking a country should be avoided and the rights of the original settlers should be respected by the newcomers.

BURLAP OVER FRAMES

How is this for an absorbent for wintering? Lay down a couple of thicknesses of burlap on top of frames of brood chamber then set empty super on top of this, fill super with good dry leaves, then put on a cover and trim edges of burlap around outside? Or should the burlap be kept off of the brood frames? MISSOURI.

Answer.—The method you propose is all right. Putting a small slat crosswise on top of the frames may have the advantage of giving an opportunity to the bees in small clusters on the outer combs to pass over towards the center to join the larger clusters, which they might not be able to do otherwise. But there are often a sufficient number of brace combs above the frames to fulfill this requirement. So the matter does not have as much importance as was given to it in the old days, when what they called the "Hill device" was invented. Almost any small stick or slat would have a similar use.

COLOR OF SWEET CLOVER HONEY

What is the exact color of sweet clover honey? I have some sweet clover honey that is a light amber and some a golden color. What could cause the difference in these shades? NEBRASKA.

Answer.—All the sweet clover honey that I have ever seen is of a light color, with a slight greenish tinge.

There is nothing astonishing about a difference in color. First, there are probably some other blossoms at the time when sweet clover blooms and if they are dark in color, their honey may be dark also. For instance, Spanish needles yield honey of about the same shade as the blossom from which it comes. It is the same with dandelion. So if you have a little mixture, there will probably be a difference owing to that.

Besides, the weather, temperature and altitude, I believe, have some influence upon the color of the honey. We have seen honey of different shades in different apiaries at the same time, and there may be other causes than these I mention for differences in appearance of the honey. Some people hold that the color of the combs has influence upon the color of the honey, but I have seen the very whitest honey extracted out of combs that were almost black. Still the yellow tint of the fall honey of our Mississippi Valley appears to have a very strong staying quality and it may tint the honey to some extent, when this is put into cells that have contained deep yellow honey.

HONEY IN BAKING—CAPPED HONEY SOURING

1.—Will you please give me any data at your command regarding use of honey in baking? I have some honey slightly sour, also some very good honey melted with wax, not suitable for placing on regular market. I would like to dispose of same and it occurs to me bakers might use it to advantage in their bread and that it will prevent bread from drying out so rapidly without detriment to the bread. Our own baker is afraid to try it.

2. Also, I wish to ask what should, or could, have caused otherwise perfectly good honey to sour in combs fully capped? This honey was sour when it was extracted, last August, it being filled with tiny bubbles in the cells, under the cappings. These combs were perfectly dry and clean, having been cleaned by the bees the fall before. NEBRASKA.

Answers.—1. Yes, there are all sorts of recipes for the use of honey in cooking and baking. I send you a copy of "Facts About Honey," which contains some four dozen different recipes. The leaflet sells at 10 cents per copy, or $3.50 per hundred. It is a very good advertisement for honey, if you give it to your customers.

Honey is used also in chewing tobacco and for that purpose they use the poorest honey, as tobacco chewers are not very hard to please in taste. Sour honey may be used for baking and also for making vinegar, using 2 pounds to the gallon of water and allowing to ferment in a warm place.

2. The sealing of honey cells by the bees is not at all a proof that the honey is ripe. In a hurry season, when the crop comes very fast and the weather is moist, the honey often does not sufficiently evaporate. If this is found out in time, it may be extracted and heated enough to evaporate the excess moisture. But such honey is never first quality.

USE FOR FERMENTED CHUNK HONEY

We are handling a little honey in this territory, and have a small lot of fermented chunk comb honey. We are anxious to know if there is any way to utilize this honey to an advantage.

We have wondered if it would answer for radiator honey or if it could be profitably made into vinegar, if there was no other more profitable use. TEXAS.

Answer.—The honey in question might be

improved by melting it at a temperature of about 160 degrees, then letting it cool and skimming off the beeswax.

But this honey, if not good enough for sale then, could be used for either of the purposes mentioned.

To make it into vinegar, use about 2 pounds of it per gallon of water. Then start its fermentation with fruit juice. It would sour readily if exposed to the air, after the alcoholic fermentation is well under way.

You will find instructions for making honey vinegar on page 545 of the November number of the American Bee Journal for 1923.

A FALSE STORY

I would like a little information about our bee business. We produce comb honey and deliver it to grocers within 75 miles of our own bee yards and have a good trade in several towns and cities.

In one town there is a beekeeper that has told all the grocers that our comb honey is made from fed sugar syrup and about half of the grocers won't buy any more. Now what this bee man says is false, as our honey is fine clover honey. Now what is the proper thing to do about this? We know the man's name and have a witness to this.

We don't want trouble, but don't you think it is too much to stand this?

PENNSYLVANIA.

It is surely an ugly thing for a beekeeper to tell lies about another. But it is still uglier to have to compel him to quit. The only thing that could be done would be to sue him for slander and demand that he bring proof of what he states. But it will not cancel the damage done. However, it might be well to bring him to justice to prevent his giving any further misstatements to the customers. He is damaging himself as well as you, for he lends himself to the suspicion that he is capable of such a thing.

The fact of the matter is that in many instances people have tried to feed sugar syrup and it has never paid, because of the large amount of it which the bees consume in building comb out of the feed. If a beekeeper had to get rich in feeding sugar syrup, it would not be worth while to be in the business.

EATING BEESWAX—BEES IN CELLAR—ADULTERATION

1. I have heard it claimed that beeswax, being indigestible when eaten, forms a coating on the walls of the stomach and is liable to cause serious indigestion and stomach disorders. Do you think this is true?

2. Is it necessary or advisable to rake the dead bees out of the hive when wintering bees in cellar?

3. Do you know of any reliable method of telling whether honey is adulterated with syrup or whether absolutely pure?

Answers.—1. No; I am quite sure that beeswax could not form a coating on the walls of the stomach. If you will try chewing pure beeswax, you will readily ascertain that it does not preserve its cohesion. It goes to pieces in your mouth; in fact the crumbling of wax in chewing is a very good test of its purity. If it keeps its adherence like chewing-gum, it is sure to be impure. In fact, if there was anything in the suggestion, chewing gum would be much more likely to create a danger to the stomach than pure beeswax.

I remember that, in the old days, when Dr. Miller and Dr. Bohrer met at bee conventions, there was always a tug of war between them as to whether comb honey was healthy to eat. Dr. Bohrer held that beeswax was indigestible and that it was therefore a mistake to eat comb honey. Dr. Miller retorted that bran was also indigestible and yet it was recommended by physicians in whole-wheat bread as healthier than pure flour bread. Both of these men practiced what they preached and both lived beyond 80, Dr. Miller living a few years older than Dr. Bohrer.

2. When you remove bees from the cellar, it is advisable to cleanse the bottom boards. We usually exchanged them for clean ones. But unless the cellar is very damp, I would hardly advise disturbing the bees to remove the dead from the bottom, in the cellar.

3. There are no simple tests that we know of, and the laboratory tests depend upon the kind of sugar with which the adulteration has been produced. However, it is very plain to all who know prices of sweets, that the most common adulterant is a cheap syrup, corn glucose being the usual one. Any one who will taste honey, pure honey, then a product adulterated with glucose, will very quickly notice that it is not so sweet as honey. That is certainly the most easy test for the average consumer. But there are other tests. Honey granulates readily with a grain which is not imitated by any other sweet that we know of. It sometimes granulates coarsely, but if melted it will again granulate in the very softest granulation. Syrups do not usually granulate and that is why the adulterator uses them.

GRANULATION, GLUE AND STINGS

1. How can extracted honey be kept from granulating?

2. What kind of glue will keep the labels on pails and glasses without coming off?

3. I have 27 colonies of bees placed about 15 feet from the line fence, and my neighbor got stung and also his horses, very badly. He was cutting rye and went past the bees when they were flying the most. Please let me know if there is any law that you cannot keep your bees that near to a line fence. The line fence is about 100 feet from the house and where I have them placed is the best place I have for my apiaries.

ILLINOIS.

Answers.—1. You can keep extracted honey from granulating for a while by heating it. It has to be heated over water and not overheated, not above 160 to 170 degrees, so it will not lose its good flavor. But why don't you try to get your customers accustomed to the idea that honey will granulate?

2. We make paste with flour and water. Mix flour with water, so it makes a liquid like thin cream; then heat it and stir it constantly until it is as thick as very thick cream. Some people mix a very little honey with it to make it stick better. We never have any trouble.

3. If your neighbor gets stung when he is on his land, he can hold you responsible, because that constitutes a nuisance. There is no need of a special law for that. Put yourself in his place. You would not want to be stung on your own land. You might prevent the bees from stinging him by putting a wire netting of half-inch mesh about 12 feet high, along the line. I have known instances where it prevented the bees from stinging, because they dislike flying through such small meshes. Otherwise, if you want to avoid trouble, you had best move your bees a little further from the line.

AMERICAN HONEY PRODUCERS' LEAGUE

WHO, WHEN AND WHY?

As a result of questions which are being asked the American Bee Journal about the American Honey Producers' League, we have requested S. B. Fracker, the secretary of that organization, to prepare a general statement on the subject. He replies as follows:

The League was organized on January 6, 1920, at Kansas City. There were present at the organization meeting about twenty men, representing most of the leading beekeepers' associations and large honey producers of the United States. Particularly influential were Messrs. LeStourgeon, of Texas; Rauchfuss, of Colorado; Terriberry, of Utah; L. C. Dadant, of Illinois; Rea, of New York; Kindig and Campbell of Michigan; Paddock, of Iowa, and Miller, of Indiana.

It was established as a union of the beekeepers' associations, commercial organizations and co-operative honey producers' sales companies in the United States

The League has been preceded by a number of national organizations of different purposes. The most recent and best known was the National Beekeepers' Association, which was organized primarily for social and educational purposes. After the organization of the League the latter association disbanded at the Buffalo meeting on March 11, 1920, and, turned over the funds to the newly organized League.

It was the original plan that the state associations would join the League by paying to the National organization $1 for each of their members. This was tried for several years, but did not work out well in practice. State associations which tried to raise their dues sufficiently with the League lost many members who were unwilling to pay the increase, and associations which did not provide for the increase were unable to unite with the League. After trying out this plan for several years the one now in effect providing for $1 membership for beekeepers everywhere, was adopted.

The American Honey Producers' League may be distinguished from former beekeepers' associations by the fact that it is a typical "trade association" organized primarily to increase the profits of commercial beekeeping. It may be compared in this regard with the larger organizations of hardware dealers, automobile manufacturers, advertising specialists, wholesale grocers, nurserymen, and others. In fact, practically every trade and branch of commerce now has a well-organized national trade association. Most of them have full time paid secretaries and in most cases there are official publications. The trade association principle has become well established in the United States, the groups of producers

having the same interests, uniting to solve legislative, marketing and transportation problems. Although the League is one of the most recent of these organizations it has already accomplished results for the honey producers which are of great value. Among the results already secured are the following:

1. As a result of facts presented by the League to Congress, the tariff on honey imports was increased from about one-third of a cent a pound to 3 cents a pound, thus greatly reducing competition with honeys from outside this country.

2. An accurate digest of all the laws affecting beekeepers has been prepared and published and is now on sale, both through the dealers in bee supplies and from the secretary of the League.

3. The Transportation Committee is representing beekeepers before freight traffic commissions in securing rates and more satisfactory shipping arrangements. Some such reduced rates have already gone into effect and others are now being considered by the traffic commissions to whom they have been referred.

4. At the request of the League the United States Department of Agriculture took up the subject of standardizing honey grades. The new colors have already been fixed and were announced by the department, and attention is now being given to the manufacture of more practical graders than are now in existence. The Standardization Committee is working on a general grading plan for the United States and when a satisfactory series of grades has been written up will attempt to secure its enactment into law by Congress as applying to all honey used in interstate commerce.

5. A brief advertising program in a journal of national distribution resulted in the sending out of 18,000 honey recipe booklets.

6. The League established a national honey week November 16-22, 1924, and beekeepers' associations in many parts of the country united in putting on extensive sales campaigns during that time.

7. The League trademark has already been designed and published.

8. A warning poster is issued, offering $100 reward for information leading to the conviction of anyone molesting the apiary in which the poster is placed. These are sold to members at $1 each.

9. One major project in which the League is working at the present time is a plan for the bonding and guaranty of the transactions of reliable southern breeders of queens and package bees.

10. The League is also working out with the federal department of agriculture a plan in which the federal government will co-operate with the states in cleaning up American foulbrood.

The beekeepers of the country are becoming more and more appreciative of the League's efforts and work and membership is increasing steadily. The number of individual members is now about 1,500, and considerable numbers of warning posters, law books, trademarks and lists of dealers have been sold.

For the one dollar annual dues the beekeepers receive the League bulletin, the use of the trademark and warning posters, legal advice, assistance in advertising and occasional special offers. But these are not the important things. What we want is to have these big grading, marketing, legislative and bee disease problems worked out for us.

The League does not take the place of state and local organizations. It is a combination of them, together with independent beekeepers, to work out national problems in the honey industry.

All beekeepers and those interested in honey production and sales are invited to join. This can be done by addressing one dollar to the American Honey Producers' League, Capitol Annex, Madison, Wis.

Winter Protection

The Department of Entomology of the University of Missouri, managed by Dr. Haseman, published in November a little advice to Missouri beekeepers on the wintering question. This reached us too late for mention in our December number. The advice is good. It says, in part:

"Between December and May the bee fights its most desperate battles with the elements. During this period, it is most in need of man's help. If you have never before given your bees any winter protection, you should do so this fall. Even if it be nothing more than a good windbreak, it will help add some comfort to the bees. You house your live stock and try to give them real comfort during the winter and the bees deserve equally as good protection.

"Remember that the bee is not one of those insects which can freeze up when it turns cold and thaw out in the spring. It must be kept active throughout the winter. The colony must keep the queen warm and comfortable, for if she freezes, then the colony is doomed. When the weather is cold the bees form a tight ball or winter cluster. Those on the surface act as covers or blankets while those in the center eat honey and turn it into heat. In other words, the colony kindles a fire in the kitchen stove and all cluster around it so closely that they cover it up. The honey is the fuel which they use and the ashes are those handfuls of dead bees which are thrown out at the front door after each cold spell. Honey is expensive fuel, worth from two to three dollars a gallon, and the ashes are worth two dollars a pound when you buy them alive as pound packages in the spring. Your bees, the same as your farm machinery and live stock, need good winter shelter, and it is good economy to provide it."

New York State Buckwheat Honey Crop

(From the American Grocer)

The arrival this week of the first carload of new crop buckwheat honey from New York State makes certain that there will be plenty of that product on hand this year in time for the Jewish New Year's, September 29, says the New York State Department of Farms and Markets.

New York State produces more than half of the buckwheat honey marketed in the United States, the report continues, and the Jewish trade, particularly the bakeries, consume most of it. A large part goes into the special cakes, both large and small, so common on the East Side at about this time of year. A strange fact concerning honey in cooking which the older American families are slowly learning from their newer neighbors is that, besides being a very satisfactory flavoring, honey tends to keep bread and cakes soft. In other words, it prevents them from drying out. The price of buckwheat honey is somewhat less than that of white honey. Both are fairly staple and subject to very little market fluctuation.

Buckwheat honey is somewhat darker in color and more highly flavored than that from white clover, and because of its flavor it is commonly preferred by those accustomed to it. The grain, buckwheat, is raised in New York mostly in the district immediately west of Albany and in the Finger Lake section of Central New York. Early in August the fields come into bloom and for a period of two weeks afford an ample harvest for the bees. Each buckwheat patch is then a mass of blossoms, so white as to resemble snow.

The beekeepers of this section are among the most progressive in the world and their plants for extracting the most modern. Some of the apiaries are very large, ranging from 100 to 1000 separate hives or colonies of bees, and their output many tons per year. The honey is stored by the bees in great flat combs of a standard size and there it remains until properly seasoned. Then the beekeeper removes the frame and without ever touching the honey, slices off the cell caps with a hot knife. The opened comb is placed in a machine where it is revolved so rapidly that every drop of honey is thrown free from the comb. This extracting device has entirely superseded the old pressing method in this country. It is much superior and is sanitary.

The most of the honey crop in the country is marketed in the extracted form, either in 60-pound cans or 160-pound kegs. In addition a 5-pound can for family use has lately been put on the market by the New York beekeepers, through their co-operative association. This association is making vigorous efforts to keep mixed varieties off the market and is guaranteeing that its buckwheat honey is both pure and unadulterated.

As a matter of fact, practically all honey offered for sale in these days is pure, the Federal and State pure food enforcement having succeeded in practically stamping out adulteration and the substitution of artificial mixtures. There is, however, some complaint of honey blenders who mix inferior and cheap grades of Porto Rican honey with mild and light colored domestic grades and sell the blend for buckwheat. The consumer's best protection against these at present appears to be the beekeeper's association guarantee.

A BEE ENEMY IN NEW SOUTH WALES

Quite a number of insects may be regarded as enemies of the bee, and one of them is the carnivorous plant bug shown in the illustration. This, popularly known as the Assassin bug, captures its prey more by the exercise of cunning and stealth than by its wing power. Hiding about the flowers, it attacks its victim while the latter is busy gathering the nectar.

At times, one sees the bugs about the hives, giving the impression that they are on the lookout for bees returning from the fields. The Assassin bug has a curved trunk, which it uses to extract the juices from the captured bees. It develops by a series of moults, and numbers of the insects at the smaller stage are at times found near the hive entrances in the act of extracting juices from dead and disabled bees. Care should be taken if the bugs are handled, for practically all species can sting or bite very severely. It is needless to say that such pests should be destroyed at every opportunity. These bugs are principally found in the coastal districts.—W. A. Goodacre, Senior Apiary Inspector, New South Wales.

HONEY ANTI-FREEZE

I want to say a word on the subject of Honey and Water Anti-freeze. I have been pretty busy supplying it to the motorists here in Du Bois, and it seems to be giving universal satisfaction.

I paved the way by a free news article on the first page of the morning paper, then a circular letter went out to six hundred automobile owners. This created an enormous amount of talk, because the idea was new, and I was busy explaining night and day. I soon saw that the only way to sell it was in solution 50-50, boiled five minutes and skimmed both hot and cold.

The 17th of November broke clear and cold, and they were waiting for me before I had breakfast; and all day long there were from two to five cars in front of my place draining and filling up. The next day was almost as busy, one hundred and sixty gallons for the two days, at $1.25 a gallon. Weather moderated and trade fell off so it has not taken over a hundred gallons for the three weeks since. But I am stocked ready for the next cold snap.

The thing we need mostly right now is a name that can be registered, or that is not an infringement on anything that is registered. One firm calls their "Radiauto." I have thought of "Honeyauto," but don't think a lot of it. Mr. Auckland, out in Iowa, calls it "Laughing Water;" you laugh while the other fellow freezes and bursts. Mr. Woodman has H2-ONEY for his; pretty good, but how do you pronounce it? In one of the other bee journals it is proposed to call it "Hydromel Anti-freeze Compound." Hydromel is the dictionary name for honey and water.

Of course it is not absolutely necessary to have a name that is descriptive, although it costs less money and time to popularize one that is. We have all been wondering why the apathy on the part of beekeepers in general as to this stuff. I put it up to Dr. Barnes, the great psychologist, and he said it was perfectly natural for anyone to refuse to get excited over anything they knew so well as the beekeeper knows honey. Naturally it is hard for them to believe there is anything wonderful about it.

John N. Prothero.

Pennsylvania.

Short Course in Advanced Beekeeping at Cornell

Plans are being completed for a short course in advanced beekeeping at the College of Agriculture, Cornell University, Ithaca, during the week of January 26. Several prominent beekeeping authorities are to be present, including the senior Dadant, De Muth, Hambleton from Washington, George Rea, Hawkins, N. E. Phillips, and Gooderham and Vaillancourt from Canada. It is certainly a fine group of well-known folks and the course cannot be missed without losing much more than the trip to take it will cost. If you are within reach don't fail to be there.

Federated Association Meeting in Massachusetts

The plans for the Seventh Annual Agricultural Meetings of the Allied Agricultural Organizations of Massachusetts, co-operating with the Massachusetts Department of Agriculture are developing with programs full of interest to farmers. There will be various meetings simultaneously which will cover all branches of agriculture from poultry and bees to milk, fruit, sheep, dairying, home economics, etc.

On Tuesday, January 6, 1925, at 2:00 p. m., the Federated Massachusetts Beekeepers' Association are holding their annual business meeting at the Armory, Worcester, Mass. Following the election of officers there will be a short address of welcome by Dr. Arthur W. Gilbert, Commissioner of Agriculture, Massachusetts. Mr. James J. Hambleton, Apiarist of the United States Department of Agriculture, will speak concerning the new discoveries, experimentation and investigations in the department. He will also speak concerning the advanced methods in the treatment, control, and suppression of bee diseases. It is also expected that other important speakers will be on the program. The bee inspectors of Massachusetts will hold a session, probably in conference with Mr. Hambleton.

The Worcester County Beekeepers' Association, who are co-operating will prepare an exhibition of honey in its various forms, wax, honey vinegar, and implements which will be displayed at the Armory during the four days of the Union meetings, January 6 to 10.

Massachusetts.

Obituary—Horace Lee

Through the courtesy of Mr. C. J. Canniford, we are informed of the death of an old beekeeper, Horace Lee, of Pecatonica, Ill. Mr. Lee was in his 97th year, had come west 60 years ago and had kept bees continuously since. He bought his first bees from Adam Grimm, the great bee man of Wisconsin, made his own hives by buying lumber in the rough and dressing it with a plane; produced comb honey mainly, raised and sold Italian queens and was very successful. He belonged to a family of long life, three of them passing the 90-year life post. His brother, Charles, 92 years old, attended his funeral. His wife died 45 years ago, but he leaves six children.

North Carolina Short Course

Our editor is aiming to attend the North Carolina short course in beekeeping, at Raleigh, January 20, 21 and 22. If nothing prevents him, he will go from there to Cornell, for the short course of January 26-30.

For information concerning the South Carolina short course, address Mr. J. E. Eckert, at College Station, Raleigh. For the Cornell short sourse information, address Dr. E. F. Phillips at Ithaca, N. Y.

Crop and Market Report

Compiled by M. G. Dadant

For our January crop and market report we asked our correspondents to give their ideas on how readily the 1925 crop would sell if much larger than 1924, and what their solution would be on moving the larger crop.

This was not asked with any idea of presaging a bumper crop to come, or a stagnation of markets, but rather to get an idea of what plans of marketing had proven most successful in the year just past, and along what lines beekeepers might work to improve the market another season.

The replies were varied, to say the least. Of the three prime factors to be considered, advertising was mentioned most often, with orderly marketing second, and proper grading and uniform quality third.

Not a single correspondent suggested that the production was too great, while several suggested that we need much higher production so that honey may be in constant supply, and thus become a staple in the markets.

Of the advertising feature, answers were divided, as to whether we should have a national marketing plan, should broadcast by radio, on the roadside, at demonstrations and fairs, in local newspapers, through government and state educational departments, or have national and state honey weeks. Probably all were in favor of a combination of all forms of advertising.

Although none suggested the raising of a big fund for this purpose through appealing direct to beekeepers, one did suggest that such a fund should be raised through asking the bee supply dealers to add 2 per cent or 3 per cent to their supply prices and have the fund administrated through the American Honey Producers' League.

A large part of the marketing projects dealt with enlarging the local retail market either by selling direct or through the retail stores. Some few deprecated the sales in glass and urged larger containers. The biggest number emphasized a gradual marketing instead of glutting the market. Several blamed the small producer for price cuts, while an equal number of small producers ascribed their troubles to the cut prices of the big producers shipped-in honey. One thought there would never be an orderly marketing until big financial concerns controlled the packing and marketing, and could thus control the price.

Quality was stressed by relatively few, though uniform grading for all states was frequently mentioned. Evidently the quality of our product is fairly high compared to price and general knowledge of the article.

After reading all the reports, one wonders whether the beekeepers are being very hard hit by poor prices on honey, or whether prices are not generally satisfactory. It would seem, if losses were being sustained by a majority of those engaged in the industry, there would be more heroic measures taken to alleviate the conditions.

Although there were many statements as to what was wrong with our honey selling system, there were almost no suggestions as to how any such remedies could be put into effect. In other words, how sufficient funds could be raised to "put across" such projects as would change the situation. And we must not deny that it will take ample funds to carry into execution any orderly plan of either advertising or education or marketing which is national or even state wide in scope.

We cannot gainsay, however, that the 1924 honey crop is moving satisfactorily.

I have before me the December 1 report of the Bureau of Agricultural Economics at Washington giving yields of honey per colony for the 1924 season. It is stated that they are about average. Reports show the per colony average for the United States 1924 crop to be 46.2 pounds, which just equals the average over the period from 1913 to 1924. 1913 showed the lowest yield with 32.2 pounds, with 1923 almost as bad with 39.1 pounds. 1920 was the banner year with 59.1 pounds average per colony.

New York, Indiana, Illinois, Michigan, Wisconsin, Minnesota, Iowa, Missouri and Colorado are above average for the country, according to the report, the other states being below average for the country.

CLASSIFIED DEPARTMENT

Advertisements in this department will be inserted for 5 cents per word, with no discounts. No classified advertisements accepted for less than 35 cents. Count each initial or number as one word.

Copy for this department must reach us not later than the 15th of each month preceding date of issue. If intended for classified department it should be so stated when advertisement is sent.

As a measure of protection to our readers, we require references of all new advertisers. To save time, please send the name of your bank and other references with your copy.

BEES AND QUEENS

HONEY IN PAILS—
Atwater, Meridian, Idaho.

SEE our display advertisement on page 39.
Loveitt Honey Co.

QUALITY COUNTS—Try Pinard's queens and package bees. Booking orders now for spring delivery. Circular free. Yours for better bees.
A. J. Pinard, Morgan Hill, Calif.

PURE ITALIAN BEES—Booking orders for 1925 delivery; 2 and 3-lb. packages. Bright and three-band queens. Write for prices. Member Southern Queen and Bee Association.
J. Allen, Catherine, Ala.

SUPERIOR ITALIAN BEES & QUEENS—Get our delivered prices; ship on day you name; no disease; ship only the best, you to be pleased in every way or your money back. Ten per cent cash with order; service and quality guaranteed.
W. C. Smith & Co., Calhoun, Ala.

ITALIAN bees and queens ready April 1st; 3-pound package or 3-frame nuclei with queen, $5.00. Two-pound package or 2-frame nuclei with queen, $3.75. Book your orders early to avoid delay. Satisfaction guaranteed. Get my quantity prices before buying.
W. E. Buckner, Mt. Vernon, Ga.

EARLY PACKAGE BEES & QUEENS that make a surplus the first season. Most northern breeder in California. See larger advt.
J. E. Wing, Chico, Calif.

TEN YEARS of experience in breeding queens of quality Goldens, also gray Caucasian. Golden queens, one, $1.25; dozen, $11.50. Gray Caucasians, one, $1.50; dozen, $15.00. Pure mating. Safe arrival guaranteed in United States and Canada.
Tillery Bros., Rt. 5, Greenville, Ala.

PACKAGE BEES and three-band Italian queens that please. Our twenty years experience here in selective breeding of queens and the shipping of bees are at your service. No disease in this section. For prices, references, etc, write
Allenville Apiaries,
Allenville, Marengo County, Ala.

I AM booking orders for two-frame nuclei and queen for early May delivery. Prices on request.
J. G. Prosser, Ft. Dodge, Iowa.

GOLDEN ITALIAN QUEENS and nuclei for 1925, the big, bright, hustling kind (the kind that gets the honey); satisfied customers everywhere. Queens, $1.00 each; 6 for $5.00; 12 for $10.00; $75.00 per 100. Nuclei, with queen, $4.50 each; 10 or more, $4.00 each. Safe arrival guaranteed.
E. F. Day, Honoraville, Ala.

BEEKEEPERS—You will never regret booking your order now for our high-grade queens. Prices: Untested, $1.00 each; 25 to 75, 85c each; 100, 70c each. Tested, $2.25 each; 25 or more, $2.00 each. Select tested, $2.65 each; 25 or more, $2.25 each. Satisfaction guaranteed.
E. E. Salge & Bros., Welasco, Texas.

PACKAGE BEES—Pure Italians. Write for prices; everything guaranteed.
J. J. Scott, Crowville, La.

FOR SALE—200 colonies of bees.
Eph. J. Cotterill, Oakland City, Ind.

YEARS of experience, good stock and attractive prices make our package bees and queens a good buy. Catalog now ready.
R. V. Stearns, Brady, Texas.

PACKAGES with queen already introduced. Buy your packages with queens introduced and avoid loss. Best pure mated Italian queens. Guaranteed. State inspected. No disease. Let our circular tell you about them and explain the advantages of our package bees and introduced queens.
A. O. Smith, Rt. 12, Mt. Vernon, Ind.

WE WANT to quote you prices on your queens for the coming season.
R. V. Stearns, Brady, Texas.

FOR SALE—St. Romain quality bees, the pure three-banded Italian bees and queens at a very reasonable price. A 2-lb. package with queen, price $3.00; a 3-lb. package, $4.00; a 4-lb. package, price $6.00. Orders are booked with 20 per cent down and balance 20 days before shipment. Deliveries to be made between April 15 and July 1, 1925. Some shipments can be made earlier if weather permits. Bees are shipped on a comb of emerging brood and enough honey for feed in transit. Bees are absolutely free from disease. I furnish health certificate with each shipment. I also guarantee safe delivery and satisfaction. Address to
John St. Romain, Marksville, La.

BOOKING ORDERS for early queens, queenless packages and package bees with queen. Write for delivered prices. I ship on the day you name.
Jasper Knight,
Hayneville, Ala.

I AM now booking orders for package bees for 1925. Three-band Italian stock, state inspected. There has never been disease in this section. Will begin shipping April 20th. Write for circular and prices.
N. L. Stapleton, Colquitt, Ga.

ORDER DIRECT FROM THE SHIPPER—We do all work our ownselves, so there is no mistake to be made. Our nice three-banded Italian only, with a government health certificate. Shipped on comb of honey; natural feed for transit; easy to transfer. Each package contains a selected untested three-banded queen. 10 3-pound packages, $45; 25 3-lb. packages, $108.75; 50 3-lb. packages, $212.50; 10 4-lb. packages, $52.50; 25 4-lb. packages, $127.50; 50 4-lb. packages, $249.70. Will start shipping April 15; 15 per cent down, balance at shipping time. Orders booked in rotation.
C. A. Mayeux, Hamburg, La.

TESTED QUEENS—$1.00 each, for the fall and winter months. Delivery guaranteed. Queens are mailed from my yards every month of the year.
D. W. Howell, Shellman, Ga.

MY BRIGHT THREE BANDS, in packages, nuclei and queens for 1925, April and May delivery. My special two pounds of bees in frame emerging brood and honey, with queens introduced, are the safest and best money makers on the market. Write for prices. Satisfaction and safe arrival guaranteed.
J. L. Morgan,
Tupelo Apiaries, Apalachicola, Fla.

I AM BOOKING orders for May delivery, from my best Caucasian or Italian race, 3-frame nuclei and queens. Apiary inspected.
Peter Schaffhauser,
Havelock, N. Car.

BIG, strong colonies in dovetailed hives, $5.
The Foster Honey & Merc. Co.,
Boulder, Colo.

BRIGHT Italian Queens for 1925.
J. F. Diemer, Liberty, Mo.

CARNIOLAN QUEENS—Bred from imported mothers of pure Alpine stock. Lockhart's best select breeding strain is their support. No better combination could be arranged. Prices, 1 select untested, $1.00; 6, 90c each; 12, 80c each, and 25 or more, 75c each. Circular free.
M. G. Ward, Lathrop, Calif.

SEE my display ad. page 29.
Jes Dalton, Bordelonville, La.

GOLDEN THREE-BANDED and Carniolan queens. Tested, $1.00; untested, 75c each. Bees in 1-pound package, $1.50; 2 pounds, $2.50; 3 pounds, $3.25. Safe delivery guaranteed.
C. B. Bankston,
Box 65, Buffalo, Leon Co., Texas.

MERRILL'S QUEENS—$1.00 each.
R. E. Merrill, Muncy, Pa.

HARDY ITALIAN QUEENS—$1.00 each.
W. G. Lauver, Middletown, Pa.

ITALIAN QUEENS—Write for price list.
C. B. Saunders' Apiaries, Merom, Ind.

FOR SALE—Golden Italian queens producing bees solid yellow to tip. Select untested, $1.50. Tested, $2.00; select tested, $2.50. Safe arrival and satisfaction guaranteed. You have got to be satisfied.
H. G. Karns, Victoria, Va.

FOR SALE

HONEY IN PAILS—
Atwater, Meridian, Idaho.

FOR SALE—Pure extracted honey, sweet clover, Spanish Needle blend; fine flavor; packed in 10-lb. pails; 6 pails to a case, at $7.50 per case.
Fred H. May, Meredosia, Ill.

FOR SALE—80 acres; bee house 44x20; 140 colonies bees, ten-frame hives with equipment. Chester E. Keister, Orangeville, Ill.

HONEY IN PAILS—
Atwater, Meridian, Idaho.

FOR SALE—Good second-hand 60-lb cans, 2 cans to a case, boxed, at 60c per case, f. o. b. Cincinnati. Terms cash.
C. H. W. Weber & Co., 2163 Central Ave.,
Cincinnati, Ohio.

FOR SALE—White and amber extracted honey. Write for prices. State quantity wanted. Dadant & Sons, Hamilton, Illinois.

FOR SALE—120 acres irrigated unimproved land in Wyoming, $30 per acre. Will grow 500 tons alfalfa per year. Easy terms. Would accept some bees in 10-frames or larger equipment on this.
Asher F. Dillard, Walthill, Neb.

HONEY AND BEESWAX

HONEY FOR SALE—Any kind, any quantity.
The John G. Paton Co.,
217 Broadway, New York.

CHOICE white clover honey in 5 and 10-pound pails and 60-pound cans. Prices on request. Sample 15 cents.
Sundberg Bros., Rt. 3, Fergus Falls, Minn.

FOR SALE—First quality basswood honey, 12½c per lb. in ton lots, F. O. B. Omaha.
Thos. Atkinson, Rt. 5, Omaha, Neb.

CLOVER and basswood blended by the bees, color and body fine. Prices upon request. State amount wanted.
W. A. Jenkins, Box 115, Rock Port, Mo.

FOR SALE—Honey in 60-lb cans; sweet clover, basswood, white clover, and other flavors. Tell us what you want. Beekeepers who need more honey for their trade and solicitors should write us.
A. I. Root Co.,
230 West Huron St., Chicago, Ill.

FOR SALE—Our own crop white clover and amber fall honey in barrels and cans; also white alfalfa in cans. State quantity wanted and we will quote prices. Samples on request.
Dadant & Sons, Hamilton, Ill.

FOR SALE—White honey in 60-lb. cans; also Porto Rican in 50-gal. barrels. Samples and prices on request.
A. I. Root Co.,
16-18 Jay St, New York, N. Y.

FOR SALE—Comb and extracted white clover honey. Extracted in 60-lb. cans, 5 and 10-lb. pails. Prices given on request. Sample 15c.
F. W. Summerfield,
Waterville, Ohio.

FINE QUALITY clover honey. Prices upon request. State amount wanted.
C. S. Engle 1327 23rd St., Sioux City, Ia.

BEESWAX WANTED—We need large quantities of beeswax and are paying good prices now. Ship to us at Hamilton, Ill., or Keokuk, Iowa, or drop us a card and we will quote f. o. b. here or your own station, as you may desire.
Dadant & Sons, Hamilton, Ill.

FOR SALE—Comb honey at reduced prices. State your wants.
H. G. Quirin, Bellevue, Ohio.

Want to Buy?

Bees, Honey, Supplies, Fixtures, Queens, Locations, Extractors, Help, Cans, Jars, etc.?

Want to Sell or Trade?

Bees, Queens, Supplies, Rifle, Camera, Old Books, Locations—In fact Anything?

Classified Ads Will Do It

At the small cost of only five cents per word per insertion.

THE AD

HONEY—Quote price car loads and less. Send sample.
Hofmann Bros., Produce Co., St. Louis, Mo.

THE RESULT

"We have gotten excellent results from the ad. we have run in your magazine for several months. We were amazed at the wide distribution of your paper, as we got offerings from practically every state within 900 miles of here.
"Hofmann Bros. Produce Co., St. Louis, Mo."

All our advertisers must be properly recommended before we will accept their copy. This is our readers' protection. In sending in your adv., therefore, include a recommendation from your banker, or at least refer us to him, and accompany your order with the cash at five cents a word, letter or initial.

OUR CLASSIFIED ADVERTISING PAGES PULL RESULTS

AMERICAN BEE JOURNAL, Hamilton, Ill.

HONEY FOR SALE in 60-lb. tins. White clover honey crystallized, 13c per pound. L. A. West Indian honey, liquid, 11c per pound. Hoffman & Hauck, Inc., Ozone Park, N. Y.

CANNIFORD'S delicious, thoroughly ripened pure honey in 5 and 10-pound pails and 60-lb. cans. Any quantity. All honey shipped out thoroughly liquefied and must be satisfactory to customer or money back. Sample 10 cents. Write for prices. All honey shipped from Rockford, Ill.
Canniford's Honey Farm,
R. R. 1 Winnebago, Ill.

CHOICE sweet clover honey for sale at very attractive prices. State quantity desired and we will quote you f. o. b. Council Bluffs or Kansas City. Signed
A. I. Root Company, of Iowa,
Council Bluffs, Iowa.

DELICIOUS Nevada honey.
C. E. Andrews, Fulton, Nevada.

FOR SALE—Clover honey in any quantity desired. Roland Brandt, Postville, Iowa.

FOR SALE—White clover comb and extracted honey. Prices on request.
Roy Littlefield, Exira, Iowa.

FANCY COMB HONEY, $5.25; in cartons, $5.50; No. 1 comb, $4.75 and $5.00; 24 sections per case; carriers of six cases. White clover honey.
J. F. Coyle, Penfield, Ill.

WHITE CLOVER HONEY in 10-lb. pails, 6 to case, per case, $9.00.
W. L. Ritter, Genoa, Ill.

CLOVER HONEY—Twelve 5-lb. pails, $10; 2 60-lb. cans, $15, f. o. b. Hamler.
Appeldoorn, Hamler, Ohio.

SUPPLIES

SOUTHWESTERN distributor for Robinson's comb foundation.
Holloway Bros., Marietta, Okla.

FOR SALE at a bargain: Ten complete ten-frame hives; Standard with metal covers. Ten hive bodies with frames, no foundation; nine comb supers with sections all nailed and painted. No disease; used three years.
Frank Dennis, Oxonia, Ind.

HAVE YOU any Bee Journals or bee books published previous to 1900 you wish to dispose of? If so send us a list.
American Bee Journal, Hamilton, Ill.

60-DAY SPECIAL SALE on standard Hoffman self-spacing frames, section holders and hives. Number one quality goods. Satisfaction guaranteed. Write today.
Schmidt Bee Supply Co.,
1420-1422 Hager Ave., St. Paul, Minn.

OWING to change of plans, I wish to sell 60 complete comb-honey supers, Root goods, latest style, in the flat, for 4x5 sections, for 10-frame hives. In original crate as received from Root, $6.50 per crate of 5. Also 1 case of 5 Root standard 10-frame hives complete, in flat, $13.00.
Merton Church, Highland Park, Ill.

USED CASES with two new 60-pound cans, 89c, export cases 95c each in hundred case lots or more. Used cans and cases 45c and 50c each per case.
The Foster Honey & Merc. Co.,
Boulder, Colo.

CONNECTICUT and Rhode Island headquarters for Root's Beekeepers' supplies.
A. W. Yates, 3 Chapman St., Hartford, Conn.

WESTERN BEEKEEPERS—We can demonstrate that you can save money on buying bee supplies of best quality. Write for our latest price list.
The Colorado Honey Producers' Association,
Denver, Colo.

MISCELLANEOUS

GUMMED LABELS—Interesting samples free. Edward Harrison,
"Perfection Printing" Baltimore.

FAMOUS FLORIDA TUPELO BELT LOCATIONS—I have several of the best bee locations for package bees, queen and honey production on the Apalachicola River for sale. These properties are in no way connected with my Tupelo Apiaries.
J. L. Morgan, Apalachicola, Fla.

SEE our display advertisement on page 39.
Loveitt Honey Co.

WRITE for application blank if your education, business experience and beekeeping knowledge would make you available for positions in our sales and warehousing organization. Address Box 377, care American Bee Journal.

WE HAVE NOW ON HAND, from Paris, a number of copies of the excellent work of Perret-Maisonneuve, in French, entitled "L'Apiculture Intensive & L'Elevage des Reines." The first shipment was delayed over two months. The price of this very progressive work is $1.50 by mail, prepaid.
American Bee Journal, Hamilton, Ill.

WESTERN HONEY BEE, 428 S. Hewitt St., Los Angeles, Calif., published by Western beekeepers, where commercial honey production is farther advanced than in any other section of the world. $1.00 per year. Send for sample copy.

GLEANINGS IN BEE CULTURE, published at Medina Ohio, is the most carefully edited bee journal in the world. Its editor-in-chief is Geo. S. Demuth. Its field editor is E. R. Root. Ask for sample copy.

MAKE queen introduction sure. One Safin cage by mail, 25c, 5 for $1.00.
Allen Latham, Norwichtown, Conn.

THE BEE WORLD—The leading bee journal in Britain, and the only international bee review in existence. It is read, re-read and treasured. Will it not appeal to you? Specimen copy free from the publishers. The Apis Club, Benson, Oxon, England. Send us a postcard today It is well worth your little trouble.

THE "Archiv fur Bienenkunde" is a valuable scientific publication. "It merits the appreciation of all beekeepers acquainted with the German language," says the Bee World (January, 1923). "The Archiv fur Bienenkunde, now in its fifth volume, is of as high grade as any bee journal which comes from abroad, dealing especially with the scientific aspects of beekeeping," says Gleanings in Bee Culture (February, 1923). Annual subscription, $2. Specimen copy free. Publisher, Theodor Fisher, Freiburg im Breisgau, Kirchstrasse 81, Germany.

THE DADANT SYSTEM IN ITALIAN—The "Dadant System of Beekeeping" is now published in Italian, "Il Sistema d'Apicoltura Dadant." Send orders to the American Bee Journal. Price $1.00.

BEE EXHIBIT AT PACIFIC LIVESTOCK SHOW

We are informed by Professor H. A. Scullen, of Corvallis, Oregon, of the success of the beekeepers' exhibit at the International Live Stock Show, at Portland, November 1 to 8. Twenty-one beekeepers donated 1,050 pounds of honey for this exhibit, which was successful in every way.

Mr. Scullen writes:

"The honey was sold to pay the expenses of the booths and hiring a lady demonstrator. It was the general feeling of the members of the State Association, who met at the Portland meeting, that the show shall be continued another year. Additional premium ribbons will be offered and the show will be opened to any beekeeper in the Northwest. It is probable that the amount of honey requested from each beekeeper will be reduced to about 25 pounds of extracted or 24 sections of comb. A special committee will be appointed by President Harris to have charge of this display in 1925.

"The attendance at the Pacific International this year was about 100,000, which shows the possibility to advertise honey as a food.

"A two-day conference of the Beekeepers' Association was held during the time that the Livestock Show was in progress, so that the beekeepers might have an opportunity to attend the International at the same time they were attending the Association. Most of the time of the Association meeting was given over to the study of disease and marketing. As an outgrowth of these conferences, the legislative committee was instructed to draft bills as follows: first, to make provisions for disease control work under the state supervision; second, to introduce a bill providing for the grading of honey, based on the principles of the Wisconsin law."

The officers elected for the ensuing year are as follows: President, C. C. Harris, 1106 E. Alder St., Portland, Ore.; Vice President, W. D. Rodda, Hermiston, Ore.; Secretary-Treasurer, H. A. Scullen, Corvallis, Ore.

SOUTHERN QUEEN AND BEE ASSOCIATION

At a meeting held at the Auditorium of the Chamber of Commerce at Montgomery, Ala., December 4, a number of prominent Southern queen breeders and shippers of package bees formed an organization to be known as the "Southern Queen and Bee Association."

Officers elected were D. E. Howell, Shellman, Ga., President; D. D. Stover, Mayhew, Miss., Vice-President; H. C. Short, Fitzpatrick, Ala., Secretary-Treasurer.

Directors: J. A. Hurt, Citronelle, Ala.; Jasper Knight, Hayneville, Ala.; H. C. Short, Fitzpatrick, Ala.; D. W. Howell, Shellman, Ga.; J. M. Cutts, Montgomery, Ala.

The intention of this association is to promote and safeguard the best interests of the queen and package branch of our industry, and of beekeeping generally. The need for an association of this kind has been very apparent for some time and it is hoped that all of the best queen breeders and package shippers, large and small, will give the association their hearty support.

The association will endeavor to bring about, by advertising and other means, better understanding between buyers and breeders, and to arbitrate disputes arising between buyers and its members when they are unable to settle same satisfactorily between themselves. The association will use every means within its power to keep its ranks clean and will put its mark of approval on every member breeder who shows himself worthy of the confidence of his fellow breeders and of the buyers of his products.

H. C. Short,
Alabama.

New Jersey Convention

The annual convention of the New Jersey Beekeepers' Association will be held at the Republican Club, 139 East Hanover Street, Trenton, N. J., January 15 and 16. Since this is the best opportunity New Jersey beekeepers have to collectively support movements for the betterment of the industry in the state, it is important that everyone who can attend be sure to come. Many of the bigger, successful beekeepers of the state are on the program and their talks will benefit you at once.

Splendid Short Course for Beekeepers at Ames

From February 3 to 6 a beekeepers' short course will be given at the Agricultural College at Ames, Iowa. It will take up the study of prominent beekeeping problems, such as wintering, feeding, foulbrood, honey production methods, marketing and queen rearing, with practical demonstrations each afternoon by people with experience. This latter feature is new and will prove of much value. Among those on the program are Professor Paddock, Professor Hughes, Holsinger, Worthington, Boggs, Kelty of Michigan, Cale and Dunn.

BURR COMBS

Just Chatters

By C. S. Swanson.

We are having regular winter weather here now. Snow shovels are the means of exercise instead of lawn mowers. The coal shovel is also used frequently. On every cold morn we see steam pouring from the radiator of every third automobile; the others have honey solution in their radiators.

Coasting and skating are the popular out-of-door sports. We have very good places here for such activities, as the lake above the power dam gives us a skating pavilion over one mile wide and forty miles long. The difficulty lies in trying to keep just the skates on the ice while skating. Also the broken country around the river and tributaries gives us plenty of hills suitable for coasting.

Taking all together I feel prouder every year to live in a locality of this kind. We have hunting and skating in the winter, and swimming and fishing in summer. We have wonderful scenery here along the river. At Hamilton, the Mississippi is held in its course on either side by high bluffs. Looking across the lake or up the river one has a view which is to be appreciated. No, I haven't any land to sell and I am not advertising a summer resort, but I have seen a few of the wonder places of the United States and I know that our river with its huge dam and mammoth power house and its surroundings is well worth the eye strain.

Christmas has once more arrived and passed on its way, leaving little children happy with their new toys, and adults happily discontented with whatever fell to their lot. I wonder sometimes if the story of the original Christmas is not often forgotten in this mad rush of selecting and giving of gifts. But after all, if some good is done, some one made happy, is it not worth the effort, and isn't this the purpose (regardless of the origin) of the custom?

As I write this (December 18) every store in the United States has Christmas decoration and is catering to Christmas trade. Suppose that the stranger from Mars (about whom these visionary writers relate when the source of stories on this earth gets low) should find himself on Earth, and suppose he was unacquainted with the Christmas custom. Wouldn't he wonder why people tried to grow spruce and fir trees in their houses and why these trees were lighted and why stockings were hung up the evening of December 24 instead of discarded quickly and half distastefully as on the other 364 evenings in the year? Yet any child could answer these questions to the child's satisfaction at least.

There are other ways of telling when Christmas grows close besides consulting the calendar. Children are models of helpfulness and politeness. And we shouldn't confine this opinion just to children. Many of us grown-ups smooth down our rough corners and try to smile cheerfully when we remember how many Christmases we have passed.

Around the office we have a peculiar method of telling when Christmas is drawing close. Packages of all sizes, weights and description are delivered here and pounced upon eagerly by H. C. D., M. G. D. or L. C. D. before they scarcely reach the premises. Presents for the family which must be kept hidden until the fateful morning.

And on Christmas morning , in every home, won't there be joy among the children! How many times have they wished for this morning to hurry along. With his new sled Jack will go over to the hill to coast. Older brother Bill will mingle with the gang, but he won't mention his new watch to the other fellows. The reason he looks at it so much is that he is afraid he will be late for Christmas dinner.

Mamie is admiring that exquisite manicure set and the mirror, comb and brush. The two sets match fine. What luck! Little Margaret is viewing with pleasure her new coat and anticipates causing no little commotion when she goes back to school.

Mother and father feel rather well pleased and satisfied with themselves. Mother wonders what to cook first in the new kitchen utensils (I didn't know the name of them) and father is learning the truth about Christmas neckties and cigars and at the same time is assembling the new radio.

And then the tree is left in the room for a few days, this being its reward for its faithful services. Jack didn't feel so well on Friday, but from the amount of candy that disappeared such an occurrence is not to be wondered at.

After New Years Day, Christmas is soon forgotten. After the disturbance the waves roll on as they rolled before, especially if they are permanent waves.

Yearly Diseases

It seems that every year we have a few diseases or disasters which cause considerable grief. This past year we have seen the terrible cross-word puzzle enter into our homes and, selecting one or more victims, it has proceeded to punish them with every conceivable torture. The victim's racked brain pleads ceaselessly for a word of six letters denoting an object valuable to bakers and found in eastern Arabia.

Then we yet have the midnight attacks of Radio which continue to rage in spite of science. The effect of this is not felt so keenly by the victim until 5:30 o'clock the following morning when it seems almost unbearable.

A very common disease and one which has no positive cure is "Bee-keeping." The first symptoms are a craving for bees and a mania for catalogs of bee supplies, bee journals, and similar circulars. This usually occurs during the winter or early spring, when it is impossible to effect a cure. Should the patient give such symptoms during July he should be forced to attend the cutting of a bee tree on a sultry night. This usually cures the patient or causes a relapse if he retains the bees in the tree.

The next stage is the accumulation of hives of bees. When the patient is seen "dickering" with the owner of some bees, he should be watched closely. This is really the last stage, although it becomes more noticeable and further advanced each season. After the patient shows a delight in lifting up frames of bees, each bee armed with a poisonous dart, there is very little hope that he will recover. If he is found walking on the sticky floor of a honey house, turning an extractor, and with hands and clothes sticky with honey, he should be disregarded, as further help will be useless. Energy should be diverted to combatting the disease in earlier stages.

Unlike radio and cross-word puzzle, the "Beefever" is very contagious, and where conditions are right, it will spread rapidly. In fact I am feeling some form of the fever coming over me now, and although it has been several years since I owned a colony of bees all by myself, I expect to invest in several "gums." I may sell stock in this undertaking, placing it on a similar basis as "fox-farming." In order to get in on the ground floor you should send your remittance at once for one or more shares in the Swanson Co-operative Honey Producing Association. Full particulars sent upon request.

Much better than this, I would suggest that each reader of this—if there are any—take ten colonies of bees and, as I will have ten colonies at the beginning of spring, we will have a friendly contest to produce the greatest amount of honey. I mean this earnestly. Is anyone interested? Don't put off writing about it just because it is a long time until spring.

Three-Ply Airco Foundation

"The Strength is in the Comb"

Non-Sagging	*Non-Stretching*
Non-Warping	*Maximum Number of Worker Cells*
Non-Breakable in Extractor	*No Gnawing Around Wires*

Some Foundation History

For fifty years we have been leading the world in foundation manufacture. In our factory was developed the Weed method of sheeting wax, and so successful was this method that other manufacturers adopted it. Next we surprised the beekeeping world by producing a "true to nature" comb that is known as AIRCO.

AIRCO Comb Foundation is refined by a special acid free process and milled on AIRCO mills with a new base angle. The bees prefer it and therefore today it is recognized as the best foundation for comb honey.

Now that we had discovered the best way to refine wax and the best way to mill it we began numerous experiments that we might give the beekeeper a better foundation for brood and extracting frames with the greatest possible number of worker cells. We tried all forms of wiring, proving that horizontal wiring was the best. We also tried all methods of reinforcing AIRCO Comb Foundation. Our efforts were finally rewarded in the production of a perfect brood and extracting comb foundation, known as Three-ply AIRCO—a foundation that means permanent perfect combs.

"The Strength is in the Comb"

Root QUALITY BEE SUPPLIES

The A. I. Root Company
WEST SIDE STATION
MEDINA, OHIO

Root QUALITY BEE SUPPLIES